DECEMBER,
1937

RC
423
.A1
J86

The JOURNAL of SPEECH DISORDERS

Editor

G. OSCAR RUSSELL, PH D.
Columbus, Ohio

Collaborating Editors

JEAN TARNEAUD, M. D.
Paris, France

EMIL FRÖSCHELS, M. D.
Vienna, Austria

M. NADOLECZNY, M. D.
München, Germany

DOUGLAS GUTHRIE, M. D.
Edinburgh, Scotland

YOSHIO HAYASHI, PH. D.
Tokyo, Japan

Official Publication, of the American Speech Correction Association in its 12th year.
Editorial Office: Speech Clinic, Ohio State University, Columbus, Ohio.
Volume 2 : Number 4

UNIVERSITY OF MICHIGAN
GENERAL LIBRARY

$3.00 per Year
Single issue $1.00

CONTENTS

PAGE

Cleft Palate—Its Surgery.....*Vilray P. Blair, M.D.* 195

On Professional Preparation: Need for Revised Teacher Certifications.....*Paul L. Pfaff* 199

Stramonium Plus Benzedrine.
For Relief of Post-Encephalitic Sequelae. Case History Autobiography.....*David J. Sobin, M.D.* 205

The Influence of Grammatical Function on the Incidence of Stuttering.....*Spencer F. Brown, Ph.D.* 207

Treasurer's Report..... 216

Speech Reconstruction After Prosthesis. Report of a Case, *Horton D. Kimball, D.D.S., D.D. Sc. and John H. Muyskens, M. S., Sc.D.* 217

Moto-Kinaesthetic Speech Training for Children, *Sara Stinchfield Hawk, Ph.D.* 231

Bilaterally Recorded Brain Potentials from Normal Speakers and Stutterers, *Lee Edward Travis, Ph.D. and John R. Knott, M.A.* 239

Nomenclature Committee..... 242

Vè Congres de la Societe Francaise de Phoniatrie..... 243

Book Reviews.....238, 248, 249, 250

Bibliography..... 251

The JOURNAL OF SPEECH DISORDERS is published quarterly in March, June, September, and December of each year by the American Speech Correction Association; $1.00 a copy; $3.00 a year (Canada and foreign, $3.50). All communications and subscriptions should be sent to the editorial and business office: Speech Clinic, 324 Derby Hall, Ohio State University, Columbus, Ohio.

Application for entry as second-class matter pending at the Post-Office at Columbus, Ohio.

CLEFT PALATE—ITS SURGERY*

VILRAY P. BLAIR, M. D.
St. Louis

Professor Koepp-Baker extended the courtesy of sending me his complete text of the study he had prepared for this occasion, with the thought that perhaps, by prior collaboration, we might together make a more homogeneous presentation.

I regretted not being able to fall in with his plan, but will attempt to make amends by not anticipating his clear enumeration of the basic anatomical and surgical facts that underlie the overlapping problems of both speech training and palate surgery. I will try rather to trace on to the present day some of the difficulties that forty years ago confronted a garden variety of surgeon, who, by the accident of circumstances, was thrown into this work. Then the teachings of its creative masters had become dimmed by time and were overshadowed in a vast and rapid expansion of surgery made possible through anesthesia, antisepsis and contributions from collateral sciences. The novice in these "middle ages" of palate surgery had not only to dig into the not too concise records of the past, but also to evaluate and often discard practices that were largely revivals from an archaic period preceding the quarter century that gave us Warren, Dieffenbach, Husson, Mirault and others of their ilk. Since then, outside of Billroth's practice of fracturing the hamular process, and Brophy's of prolonging the palate by uniting parts of the posterior pillars, and the Dorrance "push-back" operation, little of likely permanence has been added except refinements of technique and of incidentals.

But in addition to the work of those who were preserving the better traditions of the past, the palate surgeon of the nineties also had for his guidance the dictum of Gutzmann that he could on the average get better speech results in training the patient whose palate had had a surgical closure than one with a prosthetic closure. The latter was something to tie to when palate operative surgery was about at its lowest ebb.

Anesthesia was a tremendous boon to the surgeon and the patient. Asepsis of hands and instruments must be of some help, but gauze protection of the child from the bacteria projected from the surgeon's

*Presented by request before the American Speech Correction Association, October 12, 1937.

mouth, and refraining from operation during seasons of prevalent upper respiratory infection will give much greater protection against the infections that prevent tissue healing or cause slough.

The same limiting anatomical and physiological factors still confront us even today. These are a real before-backward shortness of the partially or wholly cleft palate, and a relative, if not an absolute, muscular insufficiency. To these there now has been added a minor difficulty, coming mostly out of well meant demands of speech trainers for the impossible from surgical and prosthetic correction. It arises from a difference in objective. The speech trainer aims at perfect speech and in seeking this end regards not only the palate and mouth, but attempts to bend almost every function of the patient's mind and body to this end, and would bring his pupil's environment and his associates under the teacher's control. To such a one a major defect in an essential gadget (the palate) that is supposed to have had expert attention is apt to be not acceptable or quite intolerable. When such criticism comes from high places it may be quite disturbing to the surgical beginner and might cause him to fall into greater error by attempting to do better than he knows how.

The ultimate aim of the surgeon of experience, be he trained in medicine or dentistry, is to give an intelligible, not disagreeable speech—one that will permit his patient to carry on in the more ordinary avocations and social contacts without comment or embarrassment. His immediate objective is three-fold: First, the preservation or restoration of the normal contour of the palate vault and dental arch; second, to preserve as far as possible the structures, the pliability and the muscle control of the velum. The third and paramount objective to which all other considerations are secondary is control of the air leak that occurs not only through the palate cleft but also through an abnormally wide post-velar aperture. To accomplish this latter, the surgeon concentrates on static closure of the open cleft and establishment of voluntary control of the abnormal air leak that occurs through the overwide post-velar opening. This leak is usually dependent upon both a short palate and deficient muscular action. The surgical contribution to its correction is a lessening of the size of this opening, usually by lengthening the palate.

The speech trainer teaches the patient how better to use, if not actually further develop his deficient muscle equipment. Ordinarily, the services of both the surgeon and speech trainer are necessary to attain the highest potential results. Both are vitally concerned in adding to the efficiency of the sphincter-action of the upper edge of the superior pharyngeal constrictor muscle. Here this muscular sheath is partially differentiated into a horse-shoe band which is the gate that opens, closes or modifies the area of this aperture by approximating or abutting this level of the pharyngeal wall to the posterior edge of the velum. Phonetically, its share in this meeting is the important function of the velum.

Normally, the velum is a quite motile structure which responds to the various calls for change of pitch of voice, quality, etc., and rises to the proper level when the nasopharyngeal opening is to be closed, and is long enough to do its proper share in this closure. Failure of either of the two latter functions will contribute to the air leakage. To help prevent this, it may be justifiable to sacrifice most all other velum speech-modulating qualities in the attempt to obtain a static barrier that can be met by the contracting pharyngeal wall. Adverse criticism of a hard, mis-shapen, scarred velum that meets this requirement is not always justified. Here surgery has accomplished just what the dentist does by a prosthesis, and with the added advantage that it will not wear out, is not apt to be mislaid and will continue to function even after the prosthesis-retaining-teeth have been shed.

By the same token, the surgeon can use a transplanted flap of extra-oral tissue to substitute for an all but completely missing velum or hard palate. If there remain sufficient of the accessory and constrictor muscle fibers to allow of implantation into this flap then the new velum might give a functional imitation of a normal palate. The above depicts, of course, a procedure that is rarely required, but the principle that the velum, or what substitutes for it must be made to stand by to receive the impact of the pharyngeal constrictor-band holds true in all phases of palate surgery. The length of palate needed in the individual case varies inversely with the strength and activity of the constrictor band. This varies in normal individuals and more so in those with congenital palate clefts. Therefore a length of palate that is adequate in one case might be totally inadequate in another.

We usually have the satisfaction of being able to make some sort of a prognosis in the particular case. If stimulation of the child's pharynx, either by touch, crying or speech effort causes a transverse, sharp-edged plica, or thick cushion of muscle and mucosa (Passavant's pad) to impinge well forward at the lower limit of the nasopharynx, then one can rather safely assure the parents of the likelihood of a satisfactory surgical closure. If, in addition, the child has a long palate, this assurance is still safer. If, on the other hand, the velar border is far forward of the posterior pharyngeal wall and there is little or no visible activity of a Passavant's pad, then the probable need of long postoperative training and even of secondary or more radical operating must be included in the guarded prognosis. Few, indeed, are the cleft palate cases that do not need special speech training—fewer still those that will not benefit by it.

Here as elsewhere it is good surgical judgment to withhold the more complicated, possibly more dangerous, procedures when a simpler and less drastic plan might serve and the more radical plan can be added later if needed. This is why the majority of cases are still treated by the partly efficient flap-sliding plan of Dieffenbach and Warren (to which the name of the younger von Langenbeck has been attached, though he described it twenty years later), or by

the approximation of osteoplastic palate flaps which was also proposed and practiced by Dieffenbach. Neither of these will ordinarily leave objectionable scars nor complete loss of function in any attached muscle. The palate carries no motor nerve trunks, and the lateral incisions of Dieffenbach not only relieve tension of the suture line but through them one can make an accurate mobilization without injuring the descending palatine arteries and can also insert medicated gauze packing that will protect most of the raw surface, will hold the palate flaps in firm approximation at the suture line, and further serve as a safe and rather efficient immobilization. The tense or scarred palate can result from the original lack of needed tissue or from slough resulting from infection or interference with blood supply.

The responsibility of those who assume the care of these cases is very great; especially does this apply to the surgeon. It is easy by poor technique or bad judgment to lose an opportunity or maybe the palate tissue, the loss of either of which might be difficult to compensate for. The open or the very short palate predisposes to repeated middle ear infection, which in turn can lead to deafness. This and "cleft palate" speech seriously jeopardizes the future of many children, especially of those who must get their three-R's in the open class-room, because the child is not able to hear distinctly and the teacher is not able to understand the child. This condition will also prove a handicap or embarrassment in many games in ordinary childhood contact, often with very bad psychic results. These, and not any common congenital association, is the reason it has been frequently stated in older textbooks that such children are commonly mental deficients.

ON PROFESSIONAL PREPARATION: NEED FOR REVISED TEACHER CERTIFICATIONS

PAUL L. PFAFF
San Diego, California, State Teachers College

California and New York have taken very decided steps in creating new standards for their teachers, the new Special Credential in Speech Correction gives adequate proof of this. Our greatest problem is not to correct what already exists, but to eradicate it. Too few such credentials are being sought, and those which are granted are weighted with responsibilities. In a community the size of San Diego with approximately 35,000 students enrolled, there is only one speech correctionist doing full time, and one other doing part time work. These two women must meet and test all students, and provide the remedial work necessary to refit them for a normal social adjustment. Splendid results have been reported, but it is almost a super-human task to give superior assistance to nearly 1,000 children scattered over the city in eight or ten schools. Yet, even such attention as this is inadequate, for there are countless pre-school children who need aid, and there are many others who are spastic, blind or mute. Our problem assumes more colossal dimensions the further we go.

Let us admit that the trained speech correctionist is doing splendid and valiant work, but it is quite single-handed. Study has brought us close to a number of speech clinicians, and invariably they lament the great number of children who must be slighted for the treatment of the more serious malady of stuttering. Further than this, it has been the consensus of opinion among these clinicians that once a child left the speech room, his habits reverted again to the old ways. His regular teacher was naturally so occupied that she had little time or patience to continue the work of the speech laboratory. Consequently it is obvious that co-operation plus training is needed on the part of most elementary school instructors. By way of summary, let us suggest a plan:

1. Teachers doing kindergarten and primary work through the third grade should be carefully trained in clinical psychological procedures and be accredited speech therapists.

2. Rigid physical tests should establish their fitness, and personality studies should be made to determine their ability to preside in a class situation.

3. They should receive remuneration in keeping with the time spent in equipping themselves.

4. Once in each three years, or more frequently, they should find it necessary to enroll in specially designed classes prepared to give the newest discoveries in their field. Renewal of certification should be denied if this requirement is not met.

5. In conjunction with these teachers in each city school, there should be a trained social service worker to make case studies of all students, these to be supplemented by physical data from the school doctor and nurse. The major part of the labor connected with this office would occur immediately when the plan was put into action; from then on the emphasis would be placed on newly enrolled students.

6. A skilled psychiatrist should be employed by the City Board of Education to confer with teachers, social service workers and needy students. These consultations should be of a nature destined to promote a far more accurate method of coping with problem children.

7. Extreme cases developing in lower levels as well as upper would receive special guidance in keeping with the severity of the case.

8. Case studies on each child should be supplemented as the child matures.

This plan may seem visionary, perhaps too ideal, but it must be adopted in essence if we are to direct the poorly guided social pressure which is now forcing itself upon us. Our problem is not a transitory one, nor is it one which applies simply to the present; rather it is one just beginning to assume an ominous form. Society has already begun to meet the need by setting up highly specialized machinery designed to replace the inadequacy of the home and school. I refer directly to the Child Guidance Clinics which have become so important a part in readjusting the socially handicapped child. Scores of these worthy organizations are daily being sought by distracted parents and social institutions incapable of meeting their own problems. In spite of the care and tact used in dealing with these cases, there is a certain amount of misunderstanding attached to this type of social welfare work. Society feels that such organizations are community-sustained projects set up as a last resort for salvaging what have been looked upon as doomed children. Stevenson and Smith in their recent book entitled *Child Guidance Clinics, A Quarter Century of Development,* describe clinics thus:

> The child guidance clinic is an attempt to marshal the resources of the community in behalf of children who are in distress because of unsatisfied inner needs, or are seriously at outs with their environment—children whose development is thrown out of balance by difficulties which reveal themselves in unhealthy traits, unacceptable behavior, or inability to cope with social and scholastic expectations. Its service is rendered through the direct study and treatment of selected children by a team consisting of a psychiatrist, a psychologist and psychiatric social workers, and also through focusing the attention of physicians, teachers, social workers, and parents on what is commonly called the mental hygiene approach to problems of child behavior. The essence of this approach is that behavior is studied objectively, as nearly as possible without prejudice, in the hope of discovering the causes—usually

multiple—which produce it, and that an effort is made to modify it by eradicating or abating the causes rather than by precept or the imposition of authority.[1]

The same authors continue a little later in their book by saying, "To give intensive care to more than a selected minority of all the children who might profit by it is a physical and economic impossibility for the clinic."[2] Since this is apparent, and it is obvious that expansion must follow, why is it not feasible that such expansion should be instituted at a scene nearer to the problem itself. Certainly teachers and administrators are more aware of a child's school problems than is the social service worker; then too, parents usually first turn to the school for aid in their difficulties, and when they fail to receive encouragement, they are forced to seek what aid they can find elsewhere. Naturally, the school is not always the scene or even the source of the problem, but certain it is that the school soon becomes aware of the difficulty and is requested to participate in the cure.

Yet, if children could be properly adjusted at the very start of their school lives, and if, as problems arose they were properly met by trained workers, how much less complex the whole situation might be. Imagine too the vast store of statistics and data which could be collected and compiled for future reference. Parents and teachers might talk intelligently, because teachers would be aware of so much more of the child's life than they are now allowed to glimpse. In the event that the teacher found the problem too complex to explain to parents, she could refer them to the psychiatrist whose knowledge and prestige might bear greater weight.

Dr. William S. Saddler of the Chicago Institute of Research and Diagnosis, gives one of the best known clinical outlines for cases. Unlike many other studies, it embraces a thorough neurological survey, personality adjustment pattern, a very complete physical examination outline, and a recommendation for complete intelligence testing. Thus it very capably illustrates the complexity of the problems involved, and indicates what a distinct advantage a trained worker has when he is privileged to study a carefully prepared record of his patient. Much of the data included applies to the adult, but a very great portion applies directly to children and indicates a scientific method of procedure.[3]

Child Guidance Clinics are largely responsible for the attention which is now being concentrated on a child's background and this case study presented by Saddler indicates the wealth of material that might be placed at a *trained* teacher's disposal should the system outlined in the early part of this paper be instituted. More and

---

[1]George S. Stevenson and Geddes Smith, *Child Guidance Clinics*. (New York: Commonwealth Fund, 1934), p. 1.

[2]*Ibid.*, p. 54.

[3]William S. Saddler, *Theory and Practice of Psychiatry*, (St. Louis, Missouri: The C. V. Mosby Company, 1936), pp. 175–202.

more educators are realizing that each child is a problem whose solution in the past has been much too general. When we realize that from ten to forty per cent fail in their first year of schooling because of reading difficulties alone, we can readily see how ineffective our present methods are.[4] Such cases obviously are negatively conditioned at the very start of their educational careers; sometimes they emerge after a struggle, but most often they become in one way or another our "problem children." From above, the teacher is exerting pressure to keep them to a task of learning, and she in turn is frequently not equipped to meet their particular type of disability. On their own level, social pressure is exerted by their fellow classmates who in amusement taunt them for their stupidity. It is only natural that such children should seek out their own kind or a weaker and more objectionable company. In either event the product is most often undesirable.

My contention is that these children are not at fault, but that modern poorly directed mass education is. If only the finest trained teachers were provided to start children on the complex path of learning, it seems logical that much of the delinquency we now encounter would be eliminated. We should be striking at the very source of supply, which in turn is feeding the courts of juvenile delinquency, the reform schools and eventually our prisons. Child Guidance is a part of all education, and is not a separate element set up to meet the needs of a pressing few.

One of our leading educators interested in the field of child research is Dr. Fernald at the University of California at Los Angeles. In her clinic are numerous types of reading disabilities, many of whom have been salvaged from juvenile courts. One of the finest recent examples of such boys sent to her as "hopeless" is the one we will call Bart. Several weeks ago he arrived at the clinic with a reading ability of slightly over zero, in other words just about first grade level, and yet he is somewhat over ten years of age. At the clinic he is completely contented to work from eight in the morning until three in the afternoon, and his progress is excellent. Dr. Fernald reports that he has given absolutely no trouble, and is so very conscientious about other people's possessions that he never borrows even the necessary working materials.[5] There are literally hundreds of such children who have received the wrong start in life. This boy's family is not to blame; environmental and hereditary conditions show that he faces a normal life opportunity. His psychological test gives him an I. Q. rating of 108, so he is not of inferior intelligence. Surely the responsibility for this child's retardation rests somewhere. In the past educators have been too ready to

---

[4]Emmett Albert Betts, *The Prevention and Correction of Reading Difficulties*, (Evanston, Illinois: Row, Peterson and Company, 1936), p. 69.

[5]For a full account of the kinaesthetic method which is discussed, the reader should see recent work entitled: Fernald, *Mental Measurement Monograph*, (Baltimore, Maryland: Williams and Wilkins).

shift the burden for their inadequacy upon the home or the environment, but trained social service workers are beginning to throw a new light upon the situation. In the future it may not be easy for a teacher to escape her responsibilities so lightly.

There are many teachers in our schools today who profess to have a knowledge of remedial reading, yet the difficulties they encounter, and the confusion they create prove to be extremely harmful to the child. This in my estimation is further justification for a more carefully guarded certification. The public school is no place to perform careless and unwarranted experiments, especially when the experimenter is an untrained teacher. Universities provide clinics designed to give society the best and the newest results of research; their findings are directed by trained men and women who are devoting their lives to science. Such experts are the ones best fitted to prepare our teaching candidates, and their clinics are far wiser places to experiment than are schools.

In the field of dyslexia Dr. Marion Monroe is another leading figure who has provided us with one of the finest methods for diagnostically testing handicapped children. Her book is such a valuable source of information that I would recommend it to all teachers and also suggest her *Diagnostic Reading Tests* which are published by the Stoelting Company.[6]

She has proved in *Children Who Cannot Read* that a child may fail to read, yet be of adequate intelligence. To alleviate his difficulties she has outlined a series of remedial methods designed to train his visual and auditory acuity to a point of greater discrimination. At the same time she stresses the need for emphasis on directional training to eliminate faulty motor leads which may be causing reversals, repetitions, additions or omissions of words. Altogether the work is an enlightening source of methodology.

Closely allied to the subject of faulty reading is faulty speaking. As has already been stated, the sudden change from the home environment is conducive to emotional instability. This in itself is a serious problem, but if there is added a feeling of inferiority because of failure in school, the child has an even greater hazard to surmount. The very fact that he frequently becomes a problem child at this period, indicates that he is masking his feeling of failure under an assumed bravado. But not all children employ this extreme method of releasing their pent-up emotions; instead some inhibit them only to have them break through in lisping, stammering, or stuttering.

All the data we can assemble emphasizes this time in the child's growth as one closely allied to speech disorders. The child is growing rapidly and is looking at life in a far more joyous way than he probably does at thirteen or fourteen years of age. School is an adventure to him, and he usually anticipates it with pleasure, but

---

[6]Marion Monroe, *Children Who Cannot Read*, (Chicago, Illinois: University of Chicago Press, 1932).

when he arrives on the scene, the glitter sometimes vanishes. Naturally we say that any difficulty which arises is due to loneliness, yet no one has tried to prove anything to the contrary.

Is it not true that children like grown-ups are gregarious? If so, we know that school provides them with more companions than they ever had. Do children not enjoy adventure? School in itself is an adventure, and all the mysteries it unlocks to them are greater than they had yet experienced. They learn to make and do things for themselves. Much of their dependence is taken away, and is replaced by a growing feeling of independence.

It is just as possible that poor teaching methods are as responsible for emotional instability in children as are new environments. Why not investigate this side of the question instead of being satisfied with the belief that defects occur as a result of change? If a change of environment is a harmful one, we must have more evidence to prove that it is not the fault of education instead of the weakness of the child. We are striking at fundamental issues when we endeavor to give the best advantages to our children, but if we persist in allowing our system to go unchecked, we are shirking responsibility. Each year the number of retarded children increases; each year our child guidance clinics, our reform schools and penal institutions are sought by a greater mass of needy. At no great expense we might check that growth at its very source, and at the same time raise the teaching standards in every state.

A more detailed study of reading and speaking difficulties in our university clinics gives definite proof that the burden of responsibility lies in the elementary grades, for here children are completing the speech learning begun in the home. Here, too, they are meeting new social adjustments, new problems of learning and new frustrations. The responsibility for the success of present day programs rests with teachers whose general learning may be adequate, but whose specific training is grossly neglected.

Universities are leading the way, but each state must recognize the value of that leadership, and require of its teachers the utmost in modern methods of education.

STRAMONIUM PLUS BENZEDRINE

FOR RELIEF OF POST-ENCEPHALITIC SEQUELAE CASE HISTORY AUTOBIOGRAPHY

By DAVID J. SOBIN, M. D.
(Submitted through Speech Clinic, University of Michigan, John H. Muyskeno, Director)

During the epidemic of acute encephalitis in 1923, the writer was stricken by the disease which kept him in bed for two months, and which caused considerable anxiety among the members of his family. He recovered with full possession of his mental faculties, but retained a scar in the central nervous system involving the corpus striatum, putamen and substantia nigra, the nuclei of origin of V, VII, IX, and X cranial nerves. The most significant manifestations of this scar were:

1. *Muscular hypertonus.*—Every muscle in the body was in a continual state of hypertension; relaxation was impossible; and very often he would catch himself with clenched hands, rigid arms, and teeth gnashing.
2. *Speech defect.*—Immediately after the acute phase of the disease subsided, speech became slovenly, rapid and staccato resulting in unintelligibility. This gradually developed into a spastic speech in which individual words could be pronounced without difficulty, but if a group of words or a sentence was anticipated, the mandible would lock, the temporals, masseters, and internal pterygoids would go into spasm, coincident with a spasm of the vocal folds. Speech, such as it was, could only be accomplished with the tongue held rigid and the lower jaw sliding horizontally.
3. *Sialorrhea.*—There was an occasional drooling during the day, but almost every night salivation would be excessive resulting in the pillow being wet on arising.
4. *Spastic constipation.*—In spite of all efforts to regulate the habits, constipation persisted and the only thing that relieved it was All-bran.
5. *Sweating.*—Not only in the summer did excess perspiration annoy him, but even in the middle of the winter he would break out in a profuse sweat, especially after a cup of hot coffee or tea.
6. *Ease of fatigue.*—Whenever an attempt was made to sit down and relax consciously, fatigue would become pathological. This occurred in spite of the fact that the patient was in the best possible physical condition; he was on the cross-country team in college, and kept in training by running 4½ to 7 miles daily.

There was a very slight horizontal nystagmus, and diplopia when fatigue was extreme; there was a suggestion of a mask-like facies, and a little dysphagia. However, sleep was normal, there was no Parkinson-like tremor, no pain, and no gastrointestinal disturbance.

The patient finished high school, was recommended to college on his scholastic standing, in spite of his speech defect. He finished college with a B. C. in exact science, and was accepted at the Medical school. In medical school most of the instructors recognized the difficulty and were, in the main, quite tolerant and saw no cause to hold him back. During his interneship (1936-37) the Journal of the American Medical Association published several articles on the use of Benzedrine in chronic encephalitis, but it was not until recently that he tried it on himself.

In 1927 hyocine was recommended in small doses to allay the spasm of the facial muscles and a general hypertension. But the cure was worse than the disease; it produced such a general relaxation that the patient was in a continual state of lethargy. In 1930, when the American Medical Association held its convention in Detroit, one of the neurologists (who subsequently won recognition for his exhibit) suggested stramonium in large doses to relieve the spasm of the speech musculature—one grain three times a day, and increasing the dose until 15 grains were being assimilated per day. This had the same drawback as hyocine; and so for a period of seven years no medication whatsoever was taken. However, an attempt was made at sporadic intervals to re-educate the speech muscles, to re-route the speech paths in the central nervous system, at the Department of Speech at the University of Michigan.

Some weeks ago, while doing speech correction work at the Speech Clinic of the University of Michigan, a neurologist at the Health Service suggested stramonium in small doses, together with Benzedrine—the first to inhibit the parasympathetic and the latter to stimulate the sympathetic nervous systems. Accordingly, 2 grains of powdered stramonium leaves were taken twice daily, along with 2 tablets (1-6 grain each) of Benzedrine. The result was almost sensational; strangers no longer asked to have sentences repeated; skeletal muscle hypertension was relaxed to normal, drooling stopped by night as well as by day, constipation was relieved, and the skin became flushed but dry. Fatigue became a thing of the past, and the energy that had heretofore been dissipated in keeping the body muscles in hypertonicity now became diverted to more useful channels.

Then an experiment was performed to see how much the dosage could be reduced and still get the effects. It was found that, at first, 2 grains of stramonium in the morning, and 2 tablets of Benzedrine in the afternoon would just produce the required relaxation, but a tolerance was built up to the drugs, so that now two extra tablets of Benzedrine are required during the day. There have been no ill effects from the use of the drugs; there is no undue excitement, and no disturbance of sleep.

Although this is only one case, in which much credit must be given to the Department of General Linguistics for teaching the correct patterns of speech once the spasm was removed, the writer feels that the subjective description by a practitioner will be of interest to other men who are in a position to give these drugs a more extensive clinical trial.

THE INFLUENCE OF GRAMMATICAL FUNCTION ON THE INCIDENCE OF STUTTERING

SPENCER F. BROWN, Ph.D.
Ohio State University, Columbus, Ohio

Two previous studies have reported the influence of certain phonetic factors on the incidence of stuttering. The first of these (1) reported a rank of difficulty of speech sounds for stutterers and indicated that the rank of difficulty for any individual case might differ widely from that for the group as a whole. This study was based on reading of contextual material. The second study (2) reported that in the reading of non-contextual material (words arranged in haphazard order without meaning) there were again differences in the relative difficulty of various speech sounds, but that for any given case the rank of difficulty for sounds when read in contextual material might differ markedly from that for the same sounds when read in non-contextual material. Apparently other factors besides purely phonetic ones operated. In the non-contextual material these other factors are reduced to a minimum, whereas in the contextual material they might play a considerable part in influencing the incidence of stuttering. One of the most obvious of these other factors is the grammatical one. In the non-contextual material there is no grammatical function—all words are equivalent, and no connected meaning is conveyed. In the contextual material it is conceivable that the different functions performed by various parts of speech might affect the occurrence of spasms. It was to test this hypothesis that the present investigation was undertaken. The data studied were the same as those which formed the basis of the Johnson and Brown study on the difficulty of various speech sounds (1). These data included permanent records of the oral reading performance of thirty-two cases who read approximately ten thousand words each. The method of collecting the data is described in detail in the above-mentioned report. A grammatical analysis was made of the reading selections used.[1] In an attempt to secure a finer differentiation than the conventional eight parts of speech afford, an analysis was made in which twenty-three classifications were used, of which eighteen occurred in sufficient numbers for statistical treatment. For each of the thirty-two cases the rank of difficulty of these eighteen parts of speech was determined, using

NOTE: This is a part of the University of Iowa Speech Clinic research program on stuttering, under the direction of Professor Lee Edward Travis.

[1]The writer wishes to acknowledge the kind assistance of Professor George William Small, of the University of Maine, in the grammatical analysis of the material.

the percentage of stuttering as the measure of difficulty. Then for each of the parts of speech the median percentage of difficulty for the thirty-two cases was found. These percentages were arranged in a rank of difficulty (Table I).

No statistically significant differences were found between any two subdivisions of the same general grammatical class. For example, participial adjectives are not significantly more difficult than other types of adjectives, proper nouns are not significantly

TABLE I

RANK OF DIFFICULTY OF PARTS OF SPEECH BASED ON THE MEDIAN PER CENT. OF STUTTERING FOR THIRTY-TWO CASES

Participial adjectives	14.1
Proper nouns	9.6
Gerunds	8.05
Adjectives	8.0
Adverbs	6.95
Nouns	6.6
Root verbs (in verb phrase)	5.25
Simple verbs	4.7
Subordinating conjunctions	3.8
Relative pronouns	3.15
Personal pronouns	2.55
Infinitives	2.1
Co-ordinating conjunctions	2.0
Prepositions	1.9
Auxiliary verbs	1.6
Possessive pronouns	1.2
Articles	0.6
Prepositions linked to verbs	0.0

more difficult than other types of nouns, and so on. The differences found, however, were fairly consistent from one case to another. For example, only four of the thirty-two cases did not find participial adjectives more difficult than other adjectives. There are a few significant differences to be found in the table as a whole. For example, participial adjectives are significantly more difficult than co-ordinating conjunctions and all classes below the latter. Because no significant differences were found between subdivisions of the same general grammatical class, the data were re-grouped into the conventional eight parts of speech, the rank of difficulty of these eight parts of speech was determined for each stutterer, and the general rank of difficulty for all thirty-two cases was found as before. This rank of difficulty is given in Table II.

The differences in this table are not great enough to be statistically significant. However, their psychological significance, as well as

the psychological significance of the differences in Table I, can be clearly shown. In Table III is presented the rank order of difficulty for all of the thirty-two cases of the eighteen classifications of Table I. The remarkable agreement among the cases as to the relative difficulty of the various parts of speech is clearly seen. For example, only three cases did not rank participial adjectives among the three most difficult parts of speech, and in fact only six cases did not find it either most difficult or second most difficult. Proper nouns are also seen to rank uniformly high in the order of difficulty for the various cases. On the other hand, only three cases gave articles a rank higher than fifteenth, while eight cases did not stutter in relation to articles at all. Of the few cases that stuttered in relation to prepositions linked to verbs (as in the phrase "fix *up*"), a majority found this class to be either easiest (eighteenth position) or next easiest (seventeenth position).

TABLE II

RANK OF DIFFICULTY WITH PARTS OF SPEECH GROUPED INTO CONVENTIONAL EIGHT CLASSIFICATIONS. MEDIAN PER CENT. OF STUTTERING FOR THIRTY-TWO CASES

Adjectives	8.2
Nouns	7.65
Adverbs	6.5
Verbs	3.75
Pronouns	2.45
Conjunctions	2.0
Prepositions	1.75
Articles	0.6

The same marked agreement is seen in Table IV, which presents the rank order of difficulty for each of the cases when the data are grouped into the conventional eight parts of speech. The relative difficulty of adjectives and nouns and the contrasting lack of difficulty of conjunctions, prepositions, and articles are quite clear.

The data for each of the thirty-two cases were divided into two halves. The rank of difficulty of the eighteen classifications of parts of speech was determined for each half, and the correlation coefficient of the two ranks was determined. To this coefficient was applied the Spearman-Brown formula in order to obtain a measure of the consistency of performance of each stutterer on the whole test as regards the relative amounts of stuttering experienced in relation to the various parts of speech. The median of these consistency coefficients thus obtained was .91, and their range was —.41 to .99. Only four of the coefficients, including two negative ones, were below .63. (The negative coefficients indicate an utter lack of consistency for these two cases with regard to the parts of speech

TABLE

RANK ORDER OF DIFFICULTY OF EIGHTEEN

The figures in this table refer to the relative difficulty of the various parts 2 indicating that it was next most difficult, and so on. Dashes (—) indicate in question. The case numbers assigned correspond with those assigned to

	CASE NUMBER													
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
Participial adjectives	1	4	1	1	—	1	1	—	1	2	1	1	3	2
Proper nouns	5	1	4	2	1	6	3	1	2	6	3	2	2	4
Gerunds	3	7	2	4	—	—	2	—	9	1	2	14	1	1
Adjectives	7	2	3	6	6	5	5	2	5	3	6	11	6	6
Adverbs	6	5	5	8	2	4	8	—	4	14	7	3	7	7
Nouns	2	3	6	5	3	3	4	5	6	5	5	4	5	3
Root verbs (in verb phrase)	4	8	7	3	4	—	6	4	7	11	4	10	4	5
Simple verbs	10	9	9	7	—	—	7	6	8	4	8	6	9	8
Subordinating conjunctions	9	10	8	9	—	2	12	3	15	—	13	5	10	10
Relative pronouns	11	—	14	11	—	—	11	—	3	7	15	8	14	12
Personal pronouns	13	6	10	15	—	—	10	—	13	10	14	15	11	11
Infinitives	8	—	11	13	—	—	9	—	10	8	9	16	8	9
Co-ordinating conjunctions	18	12	15	14	—	—	14	—	14	12	17	7	15	16
Prepositions	15	11	16	10	5	7	13	—	16	13	10	9	12	13
Auxiliary verbs	12	—	13	16	—	—	15	—	11	9	11	13	13	14
Possessive pronouns	14	—	12	—	—	—	17	—	12	—	12	12	16	15
Articles	17	—	17	12	—	—	16	—	—	15	18	17	17	18
Prepositions linked to verbs	16	—	—	—	—	—	—	—	—	—	16	—	—	17

TABLE

RANK ORDER OF DIFFICULTY OF CONVENTIONAL

The figures in this table refer to the relative difficulty of the various parts difficult one, 2 indicating that it was next most difficult, and so on. Dashes (—) of speech in question. The case numbers assigned correspond with those

	CASE NUMBER															
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
Adjectives	2	1	1	2	4	1	2	2	1	1	2	5	2	2	1	2
Nouns	1	2	2	1	1	3	1	1	2	2	1	1	1	1	2	1
Adverbs	4	3	3	4	2	2	4	4	3	7	4	2	4	3	3	3
Verbs	3	5	4	3	5	—	3	3	4	3	3	6	3	4	6	4
Pronouns	5	4	5	8	—	—	7	—	7	4	5	7	5	5	4	7
Conjunctions	8	7	6	7	—	—	6	—	6	5	7	3	7	7	5	5
Prepositions	6	6	8	7	3	4	5	—	5	6	6	4	6	6	7	6
Articles	7	—	7	6	—	—	8	—	—	8	8	8	8	8	8	—

III

PARTS OF SPEECH FOR THIRTY-TWO CASES

of speech for each case, 1 indicating that the speech was the most difficult one, that the individual did not have any spasms in relation to the part of speech the same subjects in the Johnson-Brown study (1).

CASE NUMBER																		Median % Stuttering for group
15	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*	*31*	*32*	
1	1	1	1	2	1	3	1	3	2	8	1	4	1	3	3	1	1	14.1
2	2	4	3	5	2	5	2	2	5	1	3	2	2	4	1	9	2	9.6
3	—	3	2	1	9	1	7	1	1	7	2	11	—	16	2	2	5	8.05
4	4	6	5	6	6	2	3	7	6	3	5	6	4	5	5	6	4	8.0
6	5	7	7	10	3	7	5	6	8	4	6	3	7	6	6	7	6	6.95
7	6	8	6	4	5	6	8	4	3	2	4	7	3	7	9	8	3	6.6
9	7	5	4	3	11	8	4	5	4	5	9	10	6	8	7	4	7	5.25
11	3	9	8	7	4	10	5	8	7	6	7	9	—	10	4	5	8	4.7
8	11	10	10	11	7	—	10	9	13	17	—	8	—	2	8	3	9	3.8
5	—	13	11	8	—	3	—	15	11	9	10	1	—	1	10	10	15	3.15
10	9	14	15	14	12	13	11	11	14	11	13	14	—	9	11	12	12	2.55
16	8	2	12	9	8	9	9	10	9	10	8	12	5	15	12	14	13	2.1
12	10	15	14	17	10	—	13	14	16	15	11	5	—	14	14	15	11	2.0
13	12	12	13	13	13	14	14	13	15	13	—	15	—	11	15	13	18	1.9
15	13	11	9	12	14	12	15	12	10	16	12	13	—	12	13	11	17	1.6
17	—	16	17	16	—	—	12	17	—	12	—	17	—	13	17	16	10	1.2
14	—	17	16	18	15	11	16	16	17	14	—	16	—	18	16	17	16	0.6
—	—	—	—	15	—	—	—	18	12	—	—	—	—	17	—	—	14	0.0

IV

EIGHT PARTS OF SPEECH FOR THIRTY-TWO CASES

of speech for each case, 1 indicating that the part of speech was the most indicate that the individual did not have any spasms with relation to the part assigned in the Johnson-Brown study (1).

CASE NUMBER																Median % Stuttering for Group
17	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*	*31*	*32*	
1	2	3	3	1	1	2	2	2	2	4	2	2	1	1	2	8.2
3	1	2	2	2	2	1	1	1	1	3	1	3	3	3	1	7.65
4	3	4	1	4	3	3	4	3	3	2	3	1	2	2	3	6.5
2	4	1	4	3	4	4	3	4	4	5	4	5	4	4	4	3.75
6	7	6	6	5	5	5	6	5	6	6	—	4	5	5	6	2.45
7	5	7	5	—	6	7	7	7	5	1	—	7	6	7	5	2.2
5	6	5	7	7	7	6	5	8	—	7	—	6	7	6	8	1.75
8	8	8	8	6	8	8	8	6	—	8	—	8	8	8	7	0.6

which occasion difficulty. At one time a given classification will be the most difficult, but at a later time this class will give very little trouble.)

In order to obtain a statistical measure of the amount of agreement of the rank of difficulty for each individual case with the general rank of difficulty for the group as a whole, the rank for each individual was correlated with the general rank. These correlations ranged from .36 to .97, with a median of .85. Only six of the thirty-two correlations were below .65. These correlations together with Table III give a picture of the agreement among the individual cases as to the relative difficulty of parts of speech.

Steer and Tiffin (3) studied the relative physical intensity of the various parts of speech and found that for six speakers as a group adverbs ranked highest and articles lowest in intensity stress, with the other parts of speech ranking between. The rank-difference correlation between the rank of difficulty of parts of speech for stutterers and the rank of intensity given the parts of speech by Steer and Tiffin's speakers is .92. This is apparently in contradiction with Fairbanks' (4) finding that a significant negative correlation exists between the rank of difficulty of sounds for stutterers and the physical intensity carried by the sounds. However, it should be pointed out that the Steer-Tiffin ranking is based on the peak phonetic power of the words, which depends upon the intensity of the loudest vowel sound, whereas the Fairbanks correlation was based on data (1) containing only the relative frequency of stuttering on initial sounds of words. Only rarely were these latter identical with the loudest vowel sounds of the words.

It is interesting to compare the phonetic factor of difficulty reported in the study previously mentioned (1) with the grammatical factor of difficulty disclosed by the present investigation. The grammatical factor appears to be more constant than the phonetic, both as regards the same individual performance from one time to another and as regards the operation of the factor in different cases as indicated by the amount of agreement among the various individuals in the group. It was occasionally found that sounds which were among the most difficult for some cases would be among the easiest sounds for others. Such extreme disagreements never appeared in the grammatical data.

Obviously there is a relationship between the two factors. It may be noted that a considerable proportion of the words included among the easier parts of speech begin with sounds toward the lower end of the phonetic rank of difficulty, whereas the more difficult sounds are found more frequently in the initial position of adjectives and nouns. These facts naturally raise the question of whether a grammatical factor of difficulty actually exists, or whether all the differences found can be accounted for on a phonetic basis. In order to study this question two parts of speech, proper nouns and articles, were selected as being representative of the upper and

lower ends of the rank of difficulty. Then it was determined whether for any sounds there were significant differences between the percentage of stuttering on the sound when it occurred at the beginning of the part of speech in question and the percentage of stuttering on the sound in all the other instances that it occurred.

In the case of articles there are only four sounds to deal with—[ð] in *the*, [æ] in *an*, [e] in *a*, and [eɪ] when the indefinite article *a* is given the long sound. Since it was always indicated on the record which pronunciation was used for *a*, an exact count of the number of spasms on these sounds when they occurred in articles was available. For each case percentage of stuttering occurring in relation to each of the four sounds when they were used in articles was compared with the percentage of stuttering when the sounds were used in all other parts of speech combined. In no instance was a significant difference found. However, most of the differences indicated that the sounds in question were easier when they occurred in articles, even though the differences were not great enough to be statistically significant. Nineteen cases found [ð] easier when it occurred in *the* than in all its other occurrences, whereas five cases showed the reverse condition. The corresponding figures for [æ], occurring in *an*, are fourteen and four. For [e] and [eɪ], both occurring in *a*, the figures are respectively twelve and five, and fourteen and four. It will be seen that some cases did not stutter at all on articles, since there were thirty-two cases in the group.

There are twenty-five sounds occurring in the initial position of enough proper nouns for statistical comparison with other parts of speech. The same comparison was made as that described above for articles. Twelve stutterers had a total of seventeen instances in which the stuttering on proper nouns beginning with a given sound was significantly greater than that on all other parts of speech (taken together) beginning with the same sound. Three stutterers had a total of four instances in which the reverse condition was true.

Considering all differences whether significant or not, we find that twenty-four (75%) of the cases had more differences in favor of greater difficulty of the proper nouns than in the other direction.

Three facts would seem to indicate that it is not possible to account for the grammatical rank of difficulty entirely on a phonetic basis. The first of these is that a considerable majority of the cases found less difficulty with articles than with all other words beginning with the same sounds. The second is that an even greater majority found proper nouns more difficult than all other words (taken together) beginning with the same sounds. The third is the agreement among the cases as to the relative difficulty of the various parts of speech as opposed to the distinctly lower amount of agreement as to the relative difficulty of the various sounds.

A fact of considerable psychological significance is that the parts of speech which receive the lowest amounts of stuttering are those which contribute least to the meaning which the speaker wishes to

convey. That this is true is demonstrated empirically by the fact that when one wishes to convey his meaning in the fewest possible words, as in a telegram or in a newspaper headline, the words which can most frequently be omitted with the least sacrifice of meaning are pronouns, conjunctions, prepositions, and articles, which four parts of speech constitute the lower half of the grammatical rank of difficulty.

A possible explanation of the present findings might be as follows. Steer and Johnson (5) have shown that stutterers stutter more when they are unwilling to stutter. This fact would seem to have a direct application to the present study. Certainly the stutterer is more unwilling to stutter on words which are crucial for the meaning of what he is saying than on words which are relatively unimportant to this meaning. And according not only to the experimental findings quoted above but also according to most theories of stuttering, the increased unwillingness to stutter on words crucial for sentence meaning should make stuttering more likely to occur on those words.

The study of Steer and Johnson offered no explanation of the exact mechanism whereby increased unwillingness to stutter results in increased stuttering, and there is nothing in the present findings to indicate the nature of this process more precisely than it has been described by theorists. A study by Van Riper (6), however, which supports the contentions of certain theorists (e. g., Johnson and Knott (7) and probably Fletcher (8) indirectly, and Froeschels (9) quite clearly), indicates that many of the symptoms of stuttering appear originally as activities apparently initiated by the stutterer in an effort to avoid stuttering. Insofar as this type of behavior comes under the category of stuttering, and insofar as it represents an unwillingness to stutter, it would be reasonable to assume that it would be most likely to occur at those points in the speech sequence at which the stutterer places the greatest premium on fluency.

SUMMARY AND CONCLUSIONS

Analysis of the oral reading performances of thirty-two stutterers was made from a grammatical standpoint. In one analysis eighteen sub-classifications of parts of speech were studied, and in the other the conventional eight parts of speech were used. All stuttering spasms which occurred, whether at the beginning of the word or at some other point, were included in the study. The following conclusions seem to be justified by the data.

1. There exists for stutterers a rank of difficulty of parts of speech, whether the conventional eight parts of speech are considered or whether a finer differentiation is made.

2. This rank of difficulty is not statistically significant, but the amount of agreement among the cases as to the relative difficulty of the various parts of speech indicates a psychological significance of the rank.

3. The grammatical factor of difficulty is related to the phonetic rank of difficulty previously reported, but differences in difficulty between different parts of speech exist independently of any phonetic differences.

4. Individual idiosyncrasies with regard to the parts of speech occasioning the greatest difficulty do not appear to be important in comparison with the strength of the group tendency. Because of this the grammatical factor appears to be more consistent from one case to another than the phonetic factor.

5. Stutterers are more consistent with regard to the relative difficulty of parts of speech from one time to another than with regard to the relative difficulty of sounds.

6. The words which are less important for conveying the meaning of a sentence are stuttered less.

REFERENCES

(1) JOHNSON, W. AND BROWN, S. F. Stuttering in Relation to Various Speech Sounds. Quart. J. Sp., 1935, 21, 481–496.
(2) BROWN, S. F. A Further Study of Stuttering in Relation to Various Speech Sounds. Quart J. Sp., in press.
(3) Steer, M. D. AND TIFFIN, J. A Photographic Study of the Use of Intensity by Superior Speakers. Sp. Monog., 1934, 1, 1–7.
(4) FAIRBANKS, G. Some Correlates of Sound Difficulty in Stuttering. Quart. J. Sp., 1937, 23, 67–69.
(5) STEER, M. D. AND JOHNSON W. An Objective Study of the Relationship Between Psychological Factors and the Severity of Stuttering. J. Soc. and Abn. Psychol., 1936, 31, 36–46.
(6) VAN RIPER, C. The Symptomatic Treatment of Stuttering. Proc. Am. Sp. Cor. Assn., 1936, 6, 110–120.
(7) JOHNSON, W. AND KNOTT, J. R. The Moment of Stuttering. J. Genet. Psychol., 1936, 48, 475–479.
(8) FLETCHER, JOHN M. *The Problem of Stuttering*. New York: Longmans, Green & Co., 1928. Pp. 362 and xiv.
(9) FROESCHELS, E. Beitrage zur Symptomatologie des Stotterns. Monatschr. f. Ohrenheilk., 1921, 55, p. 1109 ff.

LAST CALL FOR NOMINATING ASSOCIATES TO BE LISTED IN 1938 YEAR BOOK

Those who so desire should nominate at once any of their students whom they can recommend as Associates, so that their names may be listed in the 1938 Year Book. The Secretary is glad to send application forms to any Fellow upon request. Fellows who train teachers in the field of speech correction can strengthen the Association by nominating the right kind of Associates promptly.

SAMUEL D. ROBBINS, *Permanent Secretary*

NOTE. It is now too late for the 1938 Year Book owing to delay in printing this issue, but nominations should be submitted, nevertheless, and that as fast as they occur to any member.—EDITOR.

TREASURER'S REPORT

January 5, 1938.

To American Speech Correction Association:

I have made an audit of the records of the Treasurer of the A. S. C. A. for the period December 28, 1936, to December 31, 1937, and herein present my report:

The Treasurer's record checked with canceled checks. All checks were properly endorsed, and a bill or request for payment was on file for each check. The bank balance of $759.65 agreed with the Treasurer's record.

Accounts with members were checked with the cash received record and found to be in order. Five Associates and three Fellows have not paid 1937 dues. One Fellow has not paid 1936 dues.

Cash on hand December 28, 1936	$ 605.47
Dues received	895.00
Received from N. A. T. S.	125.00
1937 Convention Fees	196.00
	$1,821.47

Expenses for 1937:

To Secretary	$112.21	
To Publishing Journal	708.25	
Expenses 1936 Convention	43.85	
Expenses 1937 Convention	28.61	
Expenses of the Membership Committee	92.61	
Printing	16.00	
Postage	46.00	
Miscellaneous	14.29	
Total		1,061.82
Cash on hand		$ 759.65

The cash on hand is appropriated as follows:

To Rotary Fund	$169.78
Unappropriated	589.87
Total	$759.65

I hereby certify that the above facts are true and that to the best of my knowledge and belief the Treasurer's records are in order.

W. A. KERNS, *Auditor.*

SPEECH RECONSTRUCTION AFTER PROSTHESIS

Report of a Case

Horton D. Kimball, D.D.S., D.D.Sc.
Detroit, Mich.
and
John H. Muyskens, M.S., Sc.D.

Cases of the type discussed in this report are seen comparatively often in the office of the prosthodontist, so that the dental aspect of the case presents nothing very unusual. However, despite the fact that such cases are somewhat common, there has been, in the past, very little attention paid by the dentist to phonetics and speech reconstruction in connection with a problem of this nature. Teeth have been extracted, surgery performed, and appliances of some nature, either bridges (of a fixed or removable type) or partial plates have been inserted, and the patients have then been allowed to readjust their speech-movements as best they could.

Little regard has been given to the design of these appliances from the standpoint of phonetics. This is largely, because the profession as a whole is not aware of the important part played by the positioning of the teeth and the design of a case as related to successful and comfortable speech. Fortunately, the human body is a wonderfully adaptable mechanism, and vicarious speech movements are usually developed rather rapidly by the individual so that as a rule, there is no severe break down of the speech elements, following prosthesis. However, there are many cases where the individual is never able to readjust himself to the new restoration, and a permanent speech defect is the result. Many of the readers may immediately recall someone of their own acquaintance who wears dentures, perhaps, and who may lisp, or "whistle" the "s's," or have other speech difficulties.

It is with these thoughts in mind that a report has been made of this case, the first in a national dental publication,[1] and now in The Journal of Speech Disorders. It is intended in this paper to show how, with proper co-operation between the prosthodontist, the speech teacher, and the patient, surgery was done and a restoration constructed which fulfilled the three requirements of a successful prosthesis. These requirements are: first, esthetic effect; second, effective masticatory function; and third, adequate speaking.

[1] *The Journal of the American Dental Association* and the *Dental Cosmos*, July, 1937, pp. 1158–1168. Acknowledgment is hereby made to the *Journal* for permission to publish the material herein and to use the cuts.

With regard to these three requirements: It has been found that when one is stressed, it is often done only at the expense of the other two. So that in any restorative work, an attempt is made to gain an equilibrium, or balance between all three factors. In other words, a "happy medium" is attained.

A detailed discussion is herewith given to establish the very commonness of this type of case. The latter part of the paper presents, in abstract form, a classification of speech elements that has not appeared before, either in the literature of the dental field, or that of experimental phonetics. This integration of these two fields is of prime importance during these days of synthesis in science.

FIG. 1

When the patient first presented herself, she had the general appearance shown in Figure 1. When a child, her first, or "six year" molars were extracted. Her remaining teeth spread, or "drifted," with resultant malocclusion. There was a consequent "closing of the bite." In addition, the mandibular anterior teeth gradually extruded in their sockets, as is clearly shown in Figure 2. They exerted a continual pressure on the lingual surfaces of the four maxillary anterior teeth.

This closure of the bite and the continual pressure on the four upper incisors gradually forced them slowly outward.

The patient had various other teeth removed at different intervals during her life, so that when she presented herself at age 34, she had lost, in addition to her first molars, the following: Right, upper third and lower second and third molars; left, upper and lower second molars, and lower second bicuspid.

The patient stated that after the extraction of the last teeth about four years previously there was a very rapid closing of the bite and the maxillary anterior teeth were forced out farther than ever before.

When she finally presented herself, the four upper anterior teeth had been pushed so far forward that she was unable to bring her lips together, even with her mouth tightly closed. The lower lip was noted to rest inside the upper anterior teeth.

The bite had closed, and the lower anterior teeth had extruded or pushed up in their sockets so far that a deep groove had been made in the anterior portion of the tissue of the palate where their incisal edges contacted it.

FIG. 2

A study of the roentgenograms in Figure 2 will show the amount of space or "drift" between the posterior teeth.

The patient's mental attitude was most interesting at this stage. She was extremely self-conscious about her appearance. Apology manifested itself in her guarded speech and her social contacts. Self-imposed inferiority made of her a veritable "shrinking violet." She was decidedly careless of her dress and had adopted a "what's the use" attitude toward the world in general. A study of the pictures in Figure 1 will bring out the point, i. e., she was nicely but carelessly dressed, even though she knew in advance that her picture was to be taken.

She had been in this frame of mind for quite some time. It was intensified by the fact that she had been told by several dentists it would be necessary to have all her teeth removed and to wear full upper and lower dentures. She instinctively rebelled at this thought. When, after study of the case, she was told that it was possible to correct her condition by judicious extraction and surgery, and the use of removable bridgework, she was overjoyed. Almost

immediately a change was noted in her mental attitude. She became more optimistic in her outlook on the world. It was most interesting to note her suddenly revived interest in life in general.

Orthodontic regulation was considered highly impractical and completely out of the question.

A study of the roentgenograms in Figure 2 revealed: (1) An apical abcess on the maxillary right lateral incisor. (2) An area of infection at the apex of the maxillary right central incisor. (3) Some bone resorption about the mandibular anterior teeth, and also considerable recession of the pulps within the same teeth. (4) A fragment of an old filling in the region of the mandibular left second bicuspid. The rest of the mouth was healthy, and since the fragment of filling had not created trouble, it was not disturbed.

After careful study of the case, the following procedure was adopted:

Cast gold crowns were placed upon the lower left third molar and first bicuspid, and also upon the lower right first and second

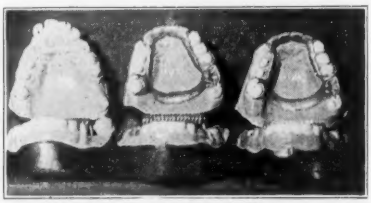


FIG. 3

bicuspids. These crowns accomplished two things: First, they filled the spaces formed between the bicuspids by their "drifting." Second, they "opened the bite" approximately 3 millimeters. In this manner, the bite was opened to the original dimension present before any teeth had been extracted.

The patient was allowed a few weeks to become accustomed to the raised or opened bite, and adjust herself to changes in speech and food taking.

A removable prosthesis was next constructed for the lower jaw, replacing the lower left second bicuspid, and first and second molars, as well as the lower right first molar.

The lingual bar joins together and supports the two halves of the lower prosthesis. It is generally placed on the inner, lingual surfaces of the lower anterior teeth, and below the level of the gum line. As a rule, this bar does not cause any lasting discomfort or inconvenience to the patient.

In this particular case, it was made small and was placed low, so as to interfere as little as possible with the tongue in movements of occlusion and constriction.

At this time also, the incisal, or biting edges of the lower anterior teeth were ground down until they presented a plain incisive surface. There was no endangering of the pulps or "nerves" by this process, because of the amount of pulpal recession indicated by the roentgenograms.

Again, a few weeks elapsed for the retraining of muscles.

After a few weeks, an impression was taken of the maxillary, or upper jaw, and a removable bridge constructed in the form of a palatal bar. It was made thin and flat and placed in the region of the second molars. This design is shown in Figure 3.

Since there is no kinesthesis in the tongue, it depends for control on touch and pressure. The tip of the tongue is sensitive to the

FIG. 4

point of being able to detect any interference from one to three mm. in size; while the sides and posterior two-thirds are only sensitive to an interference of from six to eight mm. in size. It is, therefore, best in these cases to keep the palatal bar well back in the posterior part of the mouth—in the second molar region. A wide, thin bar is, of course, more readily tolerated and provides less tongue interference than a narrow thick one.

From each end of the bar, an arm was extended anteriorly along the lingual surfaces of the teeth. These two arms supported in turn the two central and lateral incisors as bridge teeth. A large dummy tooth was placed in the upper left second and third region and retaining clasps were attached.

After this case was completed, (note carefully) surgery was performed as follows: The patient's four anterior teeth were extracted. The gums were reflected, or lifted back, and sufficient of the exposed bone, or labial alveolar process, was clipped and removed by rongeur

forceps to permit the lip to fall into a normal position and relationship, (allowance being made for resorption and shrinkage of the process as healing occurred). The upper prosthesis (removable bridge) was inserted immediately following this extraction and surgery, and the patient wore this intermediate case until the gums had fully healed and settled. The photographs in Figure 4 were taken one week after the operation. Considerable difference may already be noted in the patient's appearance.

By inserting the prosthesis so quickly after the extraction, there was no break down in the patient's speech, such as is so frequently encountered when the individual goes for months "waiting for

FIG. 5

their gums to heal." And this break down of the speech elements is always associated with a corresponding break down when a prosthesis is inserted after an individual has grown accustomed to being without teeth.

The patient was instructed to practice reading and talking aloud in front of a mirror and in this way she unwittingly aided the reformation of the facial muscle movement (expression) as well as of the speech movements.

Three months elapsed for a readjustment in the vegetative movements and speech, and to allow for the complete settling and healing of the tissues.

After this, the case was remade to compensate for this tissue settling and shrinkage, and three weeks later, the photographs in Figure 5 were taken.

It is most interesting to note her different mental outlook on life at this point. Here, again, she was aware of the fact that her

picture was to be taken. This time she "dressed for the occasion." She had a fresh hair wave; her lips and cheeks were rouged; she had on a velvet dress, and took pride in her appearance.

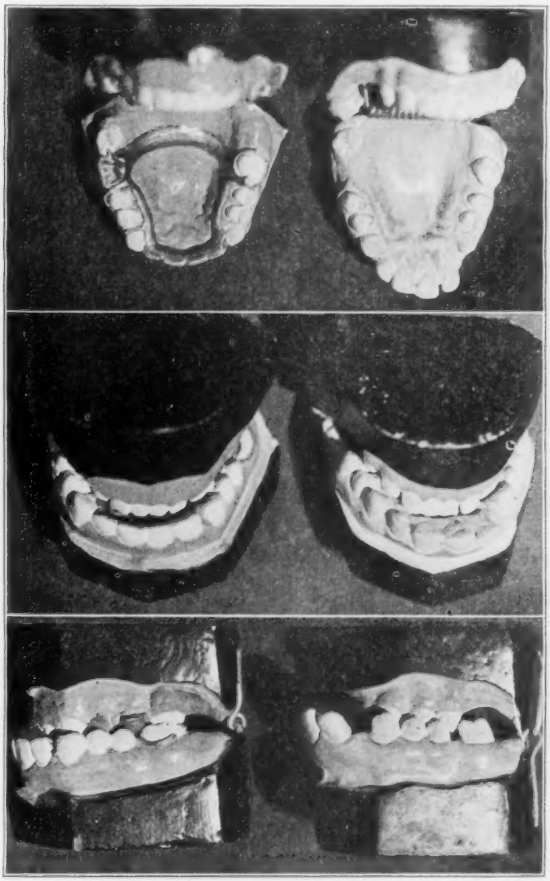


FIG. 6

A case of this nature is most gratifying to the operator, for here, in the case of this woman, her life was remade. She obtained a position in a store, and eventually married again, (her first husband having died several years previous), life was once again worth living.

Consonantal Groups	Bilabials Sonant	Surd	Labio-dentals Sonant	Surd	Interdentals Sonant	Surd	Dentals Sonant	Surd	Prepalatals Sonant	Surd	Sonant
1. Plosives and stops	b	p					d	t			
2. Nasal continuants	m						n				
3. Fricatives	w		v	f	ʃ	θ	z	s	ʒ̄	ʃ	j
								and combinations, see palatograms			

4. **Vowel Groups**

Rounded vowel series

ɔ—ball, Paul, all, fall
ʌ—but, putt, tut, tut! cut
ů—bull, pull, full
o—boat, pole, foal, cold, goal
u—boot, toot, shoot, fool, cool

FIG. 7

Traditional Classification

This case has been in place now for almost five years, giving perfect satisfaction. The improvement in speech, and the general appearance, as well as the psychologic attitude have been quite amazing.

Figure 6 shows models illustrating the original condition as compared with the case when it was finally completed.

In this type of case, the apparently slovenly speech appears to be extremely defective. So many of the consonants and vowels are made with all manner of compensations. These compensations in an intelligent person are to be expected. The result in the totality of speech may seem to be exceedingly slovenly and varied, suggesting many and multiple bad sounds. This is in reality the product of but one variation in structure, namely, the maladjustment of the teeth. Since 80 per cent[2] of all our specific speech movements are made in the anterior part of the mouth, it will be readily seen how important it is to have a symmetrical positioning of the anterior teeth.

One of the many ways in which the consonantal and vowel sounds which constitute speech may be classified is as follows:

1. Bilabial and dental stops and explosives.
2. Bilabial and dental continuants, initial and final.
3. Bilabial, labiodental, interdental, dental and prepalatal fricatives.
4. The rounded vowel series, which are in reality the product of bilabial tetany.

Figure 7 gives words that are illustrative of the various vowel and consonantal sounds.

The foregoing type of classification keeps recurring in dental literature and is quite generally accepted. It should be remembered that even phonetic symbols used in these forms, although an improvement on the alphabet, do not adequately depict the "sounds" of speech.

Emphasis has constantly been placed on the static positions of the various muscles used in speaking. These static positions (in reality, momentary rest positions), do not at any time play a part in the speech process as a whole. One must keep constantly in mind that all speech is dynamic, and that muscles move to produce the sounds. After all, the dentist is not interested in sounds and symbols for sounds, but rather in the actual moving muscles which are productive of them.

In the classification just presented, and in all other methods of speech classification, the moving muscles have been left out of consideration. These systems of classification are of value only as far as they more or less mechanically catalog various speech sounds, but further than that they are useless.

---

[2]Shohara, H. Helen. Abstract of thesis, *Quart. J. Speech*, June, 1935, pp. 343–348.

Consonant		Movement: Occlusive-circular Constrictive	Reduction of occlusion or constriction by longitudinal contraction	Both
p	as in	hop, mop, stop	pot, par, put	mopping, flipping
b	" "	rob, daub, tub	board, ball	rubber
m	" "	ham, ram, lamb	man, mat, mum	hammer
t	" "	hat, rat, bat	tack, top, ton	hatter
d	" "	rod, bad, sod	dog, do, dull	rodent
n	" "	ran, tan, sun	nat, note, not	running
w	" "	how, sew, new	wool, wet, warm	mewing
		This has no consonantal value here		
v	" "	nave, love, stove	valley, vat, varry	never
f	" "	stuff, cuff, calf	full, fall, fat	buffer
ð	" "	weather, father	than, then, there	feather
θ	" "	myth, filth, stealth	thistle, thumb	without
s	" "	miss, hiss	sister, sit	hissing
z	" "	razz, jazz, maise	zebra, zoom	gazelle
ʃ	" "	mush, push, slush	sugar, sure, shun	mention
j	" "	Never occurs here in English but in the vowel [i]	union, yes, yea	

FIG. 8
Reclassification

A reclassification of all of the consonants will give a more dynamic picture of the interference and necessary compensatory adjustment.

There are two large groups of muscles working to produce the opening and closing of the tube when speech is formed:[3] 1. A set of muscles circularly arranged about the openings of the mouth, pharynx and larynx. 2. A set of longitudinally arranged muscles about this continuous tube. These muscles, working in definite serial order, produce the functions of swallowing and of sucking, and later on integrate with the muscles of chewing. They have been conditioned (1) to produce complete occlusion of the tube, and various degrees of constriction of the tube, and (2) to reduce the foregoing conditions, that is, to enlarge the tube by their contractions.

Applying this system to the patient in question, one has then the consonants produced by: 1. The orbicularis oris muscle, and by the opponents of the orbicularis oris, the triangularis and the caninus muscles. 2. Combinations of the styloglossus and genioglossus in constrictive and occlusive or peristaltic order; or reducing order.

Bearing in mind that the patient had by slow degrees been forced to make speech readjustments, it will be understood that all consonants, normally products of these muscles, were made by other muscles substituting for those unable to function properly. Likewise, the rounded vowels, which are functions of the above-mentioned peristaltic order, were the products of but half of the orbicularis oris and of the other muscles or hard parts serving vicariously for the half which had become afunctional. The resultant sounds, lacking the precision of movement, lacked the clarity of tone. Especially in the case of the fricative is this loss of sharpness and specificity productive of what is so thoughtlessly called slovenly speech.

The palatograms in Figures 9 and 10 illustrate diagrammatically the contact areas made in this case by the interdental, dental and prepalatal consonants. Figure 9 presents these contacts as made before prosthetic correction, and Figure 10 illustrates the same consonants as produced after prosthesis.

The various dotted lines represent different consonantal sounds in combination with the vowel "a" as described in the legend accompanying each diagram. The light areas bounded by these lines indicate the regions actually touched by the tongue in the formation of these consonantal sounds. The shaded parts are the points where no contacts are made, while the diagonal lines in Figure 10 show the area covered in the palate by the partial denture that was constructed for this case.

A close study of the diagrams in Figure 9 will enable one to see quite clearly why the patient encountered such difficulty with

[3]Shohara; H. Helen. Abstract of thesis, *Quart. J. Speech*, June, 1935, pp. 343–348.

consonantal sounds before the correction was made. By a similar study and comparison of Figure 10, one can readily understand how

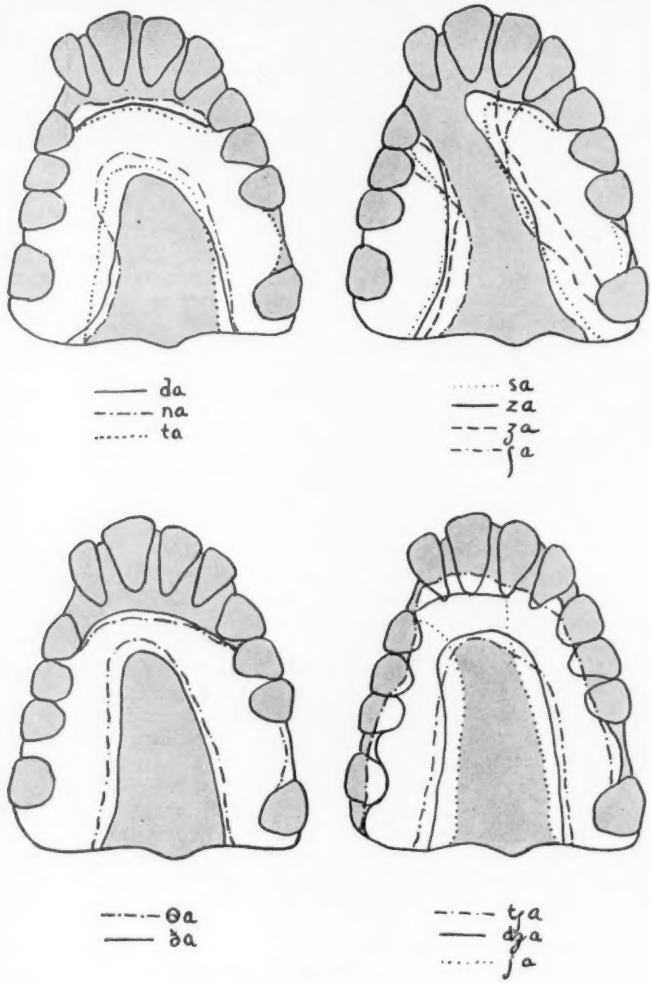


FIG. 9

this correction made such a vast improvement in the patient's speech.

Care should be taken in the interpretation of the palatograms to consider that the contact area is the product of movements resulting in consonants, and of position tetany of other muscles, resulting in vowels.

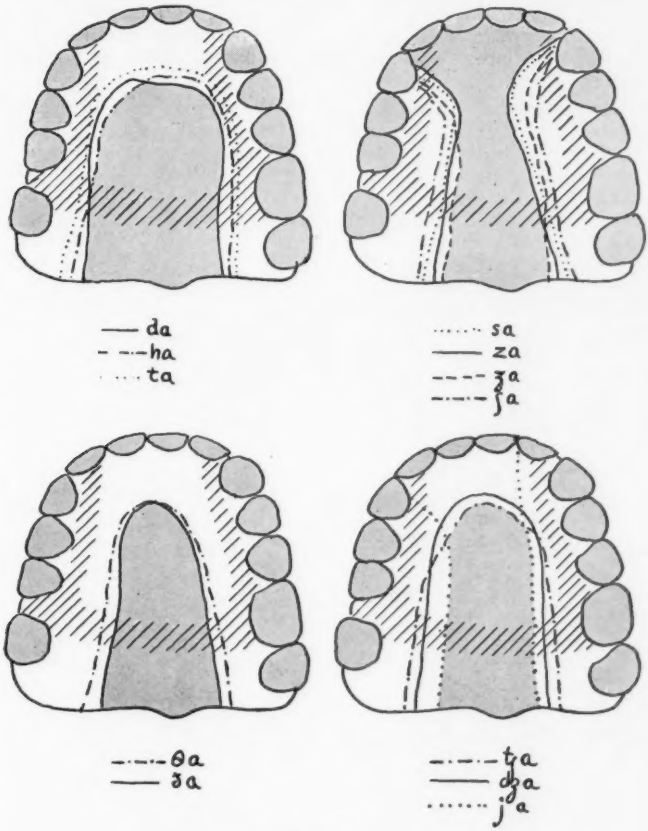


FIG. 10

Fricatives, even when produced under favorable conditions, carry so slight a power to stimulate the listener that they are rapidly losing their differing elements, as for instance, in such examples as "gim-me," for "give me," or "wi-fi dollars" for "with five dollars," etc.

The specificity of production of all these consonants is determined largely by: (1) the resultant sound check from hearing, and (2) the touch-pressure, kinesthesis pattern of control sensations.

Now, since the patient, in hearing others speak, was constantly reminded of her inability to pattern her speech after the acceptable standard, she, by this very self-analysis, developed a complex about her speech which showed in unwillingness to make contacts with others of her kind. A whining apology and a broken personality were the result.

Attention should here be called to the manner of constructing the prosthesis: The intermediate, inserted immediately after operation, slowly permitted the afunctional lip to come back into play of speech movement. It likewise began to reform the conditions under which the vicarious movements had developed. In this connection, it should be noted that the subject began to appreciate, perhaps from observation of herself in a mirror, that the seeming sneering smile was beginning to correct itself, and she, by practicing before the mirror, unwittingly aided the reformation of speech movements connected with the orbicularis oris and opponents. Both the intermediate and the final prosthesis, by a reconstruction of favorable conditions for the fricative group mechanically sharpened the auditory, kinesthetic and touch-pressure control over movement.

Little mention has been made of the lower prosthesis in this discussion of speech, since it plays so small a role in the walling and definition of movement. It should be noted that the reformation of the leverages of the muscles of the tongue was greatly enhanced by this fuller shelf which acted as a rest for the base of the tongue, the vicarious elements within the tongue muscle groups being thereby reduced enormously.

MOTO-KINAESTHETIC SPEECH TRAINING FOR CHILDREN

SARA STINCHFIELD HAWK, Ph.D.
University of Southern California; Hill-Young School of Speech, Los Angeles

The muscle sense, or sixth sense, which has only recently been included in psychological categories of the special senses is playing an increasingly important part in progressive educational training. Since the discovery that kinetic sensation not only guides the execution of gross muscle movements, but also often leads to the initiation of finer accessory movements by the association of the two, kinaesthetic training has come to be recognized as an important adjunct to special education.

Since physiology has established the fact that there are sense organs or receptors within the muscle fibers of the body as well as within the joints and tendons, it has been possible to make use of kinesthesia to a much greater extent in the education of normal, retarded, and exceptional children. We know that the muscle sense plays an important rôle in the control of reflex and voluntary movements. Lacking this type of sensitivity, a person may not be conscious of muscular fatigue, may lack power of localization for sensation within these parts, and may lack proper control of many types of habitual movements, neither sensing how to start or how to end them.[1]

According to the physiologist[2] we have not only simple, and co-ordinated reflexes producing orderly and useful movements, but we have also convulsive reflexes, as in spasms, which produce incoordinate and useless motor responses. When the irritability of the nerve cells is greatly increased, these incoordinate movements may occur. Either the normal inhibitory influences are not reacting, or an intense sensory stimulus has aroused an exaggerated motor reaction. Any interference with the transmission of a nerve impulse may easily lead to a chaotic, disorganized series of movements, as in stuttering. The condition of the brain and spinal cord have a great deal to do with the utilization of sensory stimuli and the direction of motor responses, as the reflex centers not only control the nutrition, but all of the co-ordinated activities of the body cells and organs. It is essential that these centers should have a normal blood supply.

[1]Woodworth. Psychology. Henry Holt and Co., N. Y., 1929, pp. 322 and 398.

[2]Howell. Textbook of Physiology. W. B. Saunders Co., 6th Edition, pp. 142–155.

Studies in speech pathology throw important light upon delayed speech in childhood and by considering the causes of abnormal speech in handicapped children, we learn a great deal about normal speech.

The normal baby's first vocalization is a purely reflex birth cry. Later vocalizations are emotional sounds, developed in response to environment and closely linked with the child's needs and activities. Articulate language has to be acquired by a highly complex process which is truly human, and made in imitation of adults or other children. Primitive cries, groans, chuckles, and croons give way to sounds which are meaningful and which are related to concrete objects in the environment. Concrete concepts, based upon that which is actually present to the senses, only gradually develop into abstract ideas. When the child gains the ability to think in terms of abstractions he has made an extremely important advance in his thinking. The vocalizations which are at first largely emotional and impulsive in nature, may soon be modified and greatly influenced by environment. One tiny infant may coo and laugh when taken from the breast, another whimpers, still another kicks and screams, while a fourth remains indifferent. Thus very early in life we see the manifestations of different types of personality as well as modified reactions in individuals due to environment. Heredity and environment are already working together, in the molding and expression of character.

Internal bodily reactions accompanying various emotional states may be modified along with the expression of emotions, and a new set of habits, desirable or undesirable, may be set up after a few repetitions of certain stimuli. This process of modification is called "learning." The child may cease to respond, that is, make a negative adaptation to stimuli which have no meaning for him; or he may learn to respond to certain cues or signals quite normally. The superior child may be able to solve a new and difficult problem the first time it is presented. This requires intelligence, motor control, good habits, and a favorable environment. The more the child learns to make this type of response, the better his outlook on life.

In an article discussing the infant's approach to the forms of adult speech[3] Lewis finds that in attempting to distinguish subtle differences between consonants as made by adults, the child often replaces them by cruder vocal movements. He often slurs middle consonants, gives many of the frontal consonants correctly, such as: p, m, w, f, v, t, n, th, back-palatal k, g, ng, but substitutes frontal articulations for many difficult consonant compounds. He often replaces a difficult consonant by one which appeared chronologically earlier in his history.

Children learn by hearing, by observing and by doing. In speech learning we have hitherto considered that learning by hearing was most important. Some psychologists maintain that all normal

[3]Lewis, M. M. Proc. Second International Congress Phonetic Sciences, London, 1935.

speech is the result of auditory stimulation. Those who have worked with the blind or the visually handicapped child know that there is a history of early delay in walking and talking on the part of these children, even though their hearing is normal. This would indicate that visual stimuli also play their part in the development of normal speech in many children. We found this to be so in three schools for the blind: Perkins Institution, Pennsylvania Institution for the Blind, and the New York City School for the Blind. Our speech surveys between the years 1924 and 1931 indicated that nearly half of these children needed intensive speech training, and that there was a high percentage of speech defect. The same was found to be true of two schools for the blind in Vienna, where a speech survey was made by the writer in 1931. Hayes[4] found a smaller vocabulary in blind children than in seeing subjects. Maxfield[5] stresses the need of a study of language growth in blind and low-visioned pre-school children. She began her studies with children of the third year. This is one of the earliest ages at which speech has been studied. She found a surprising number of emotionally-toned responses in her blind children as compared with sighted children; she found that they asked more questions and gave fewer commands than sighted children.

The literature of the deaf is full of references to the speech of the child with an auditory defect. It is often found that the child with a severe deafness becomes a better lip reader than one who is merely hard of hearing. In training the deaf it is generally recognized that children need a very different type of training than adults. The Muller-Walle method of training the deaf in speech by means of lip-reading was developed by a teacher of the deaf in Hamburg. The method requires a knowledge of the various positions, through visual observation. Practice in following the movements with the eyes forms the basis of lip-reading skill. The individual sounds are closely blended into words as soon as possible, and words into sentences so that the child may realize that speech understanding is based not upon knowledge of the *separate* sounds, but on *groups* of sounds blended together to give meaning. This method has formed the basis for many systems of speech training for the deaf which have been developed here and abroad. Recent methods emphasize not only the visual and auditory approach, but stress the feeling of the lips and muscles as the sounds are made. All of these methods, however, are essentially based upon visual observation.

Wright, in discussing the little deaf child, states that even in the early years of childhood we may use the power of sound perception even when the hearing is deficient, as children usually have some remnant of hearing. Early training can do much to keep

---

[4]Hayes, S. P. Binet-Simon Intelligence Tests for Use with the Blind. Perkins Inst., Boston, 1930.

[5]Maxfield, K. E. The Spoken Language of the Blind Pre-School Child. Archiv. of Psych., N. Y., 1936.

alive, not only any residual sound perception which the child possesses, but training helps to develop other organs of the brain associated with hearing. Without use these powers may atrophy or be lost. While it is often impossible to determine hearing losses with accuracy in the case of young children, the understanding and intuition of mothers make it possible for them to understand more clearly than the stranger or a specialist, how much the child is storing up and really perceiving from his contacts with daily stimuli. Workers with the deaf stress the need of developing other faculties to supplement imperfect hearing. The child must train his brain to associate ideas with the series of movements of lips and face that accompany speech. "He must develop a sensitiveness to vibration and a conscious control of muscles whose action is usually not under the control of the will—he needs not only special training of the tactile, motor-sensory, sensory and visual senses to enable him to apply a language and speech, but he needs a special presentation of the problems of language and speech if he is to overcome the restrictive effects of deafness. Language must be presented to him so clearly and copiously that he will gradually acquire a vocabulary."[6]

With the blind-deaf child, the visual cues being ruled out, and avenues of hearing destroyed, the child must depend largely upon motor and kinaesthetic cues. He must learn by doing, by touching, by feeling, and by arduous practice, how to produce the serial order of movements necessary for the enunciation of a single word. While this process is very easy in a simple word like "cow," consisting only of a back tongue movement for the sound represented by the "c" and a diphthong an (ah-oo) made by alternately extending and then rounding the lips, simultaneously with a modification of the tongue movement, it is more difficult when a word consists of several consonants and vowels.

By the eighteenth month infants should have a number of words which they use with appropriate meanings. At two they should be using short sentences, by the age of three they should have acquired all of the sounds of English, and be able to use them in words related to their environment. We believe, therefore, that workers in the field of speech, both with normal and with the handicapped child, have placed the age of speech training unfortunately late. Workers with children of pre-school age find that some important habits along lines other than speech become crystallized between the eighteenth month and the third or fourth year. For this reason it is important that much research should be done on the *speech* of the very young child, and that methods for the training of the very young child should be utilized as early as possible. Time after time parents of speech-handicapped children wait too long before undertaking corrective treatment of speech defects, until the sound patterns have been firmly rooted in the speech centers, and wrong associations formed between groups of sounds. While most of these difficulties

[6]Wright, J. D. The Little Deaf Child. Wright Oral School, N. Y., 1928.

could have been eliminated with little difficulty when the child was very young, it is much more difficult to eliminate them when the child is of school age.

In discussing educational plans for children with cerebral palsy[7] Lord found that these children had severe motor disturbances involving arms, legs and speech mechanism. Lack of progress was sometimes due to inability to express intelligently, and to lack of experience due to the physical handicap. Relatively rapid advance in mental development was often made during the early pre-school years, whereas advance in later years was not elicited. With children of adequate intelligence, learning occurred in spite of the motor handicap, so that many children were able to do the equivalent of a grade a year. Reading difficulties were often found, and special educational techniques were usually carried on under protected home or hospital conditions. In many cases public and private schools were found willing to make the necessary concessions to meet the motor handicaps of the child. Much stress was laid upon guidance of mothers in educational planning. With children who were average or above average in comprehension, Lord found that many could compensate for their defects in some satisfactory way. Children could learn to count and to give individual sounds oftentimes without developing a number or language concept. It was also found that handicapped children are unable to sustain prolonged effort to the same extent as the normal child, and they vary more in their performance from day to day. Lord finds that parents usually realize when the child is not making normal progress by the end of the first year. It is important that doctors, psychologists, and parents should agree as early as possible upon the nature and extent of the handicap, in order that remedial measures may be undertaken as early as possible, otherwise valuable time is lost educationally. It is necessary that the child should not be pushed too fast, yet it is important to realize that academic success of the child not only gives great satisfaction to the parents, and compensates somewhat for the physical disability, but furnishes an emotional and an intellectual outlet for the child which serves as a real safety valve to his personality, and gives him a place in life.

Experimental work by the author and Edna Hill-Young, on about 250 children in three nursery schools, with crippled children and those with educational handicaps, in Los Angeles, has disclosed that many children are unable to learn to read by the "look-and-say" or the "hear-and-say" methods, but they acquire reading very easily by the Fernald Tracing Method and kinaesthetic approach. Many such children have received extremely poor grades in scholastic subjects, and after remedial treatment have not only come up to grade, but in many cases have gone considerably above the norms for their age and grade.

---

[7]Lord, E. E. Children Handicapped by Cerebral Palsy. Commonwealth Fund, 1937, Ch. 4–6.

Similarly it has been found that many children learn to talk more readily through forming motor, and kinaesthetic impressions of speech sounds, than by the sensory processes of hearing, and seeing, and auditory imitation.

In the Hill-Young School of Speech not only have we found that the speech-defective child is usually of average intelligence, but he is often better on motor tests than on those requiring abstract thinking and verbalization. Moreover, following speech training, not only have there been surprising advances in I. Q. but improved motor co-ordination and socialization. The Hill-Young method of moto-sensory speech training differs from other methods in use, in that it does not depend upon auditory or visual stimuli alone to initiate speech movements. The teacher actually sets the pattern for the child, giving suggestions to the muscle groups by muscular and kinaesthetic sensation, so that the child knows definitely by pressure exerted at the base of the tongue on the outside of the throat, that the tongue moves backward and upward for *k*, *g*, and *ng* sounds, for example. While at first it may be necessary to use the tongue depressor to stimulate the tongue to rise for the *t*, *d*, and *n* sounds contacting the alveolar process just in back of the upper front teeth; after a time (varying according to the sound desired), a light pressure above the upper lip in mid-line, on the outside, is all that is necessary to give the child the suggestion that will enable him to execute the proper tongue-end movement. He can be shown the difference between the voiceless "*t*," and the nasal "*n*," also, by muscular sensation, according to Edna Hill-Young, who has originated a new and individual method which is capable of starting speech in the speechless. This method carries with it great possibilities for the prevention of speech difficulty through early training.

Often by the use of the "Hill-Young Method," in the first contact of teacher with child, if a child is co-operative, correct words will be produced which have never been spoken before. The correct patterns for words are thus obtained before the practice begins. The practice consists of the repetition of correct forms only, never an attempt of a "trial-and-error" kind, in which the child blindly sets for himself incorrect patterns to follow, comprising muscular movements, which require much more time to correct than to learn correctly at the outset.

The definite suggestion to the muscles as to where and how to move may start the child off on the right track during the period of speech acquisition and break up the tendency to form wrong habits and to repeat the wrong sounds until they have become firmly fixed. Moreover, in cases of defective or delayed speech this kinaesthetic aid is more direct than any of the former sensory processes, in that it puts the child through the actual ***motions***, gives him the actual experience of *doing* the thing correctly, and releases him from the tensions and emotionality which have so long been associated with his wrong speech habits. He learns to associate sounds and ideas, to build them up into entire sentences and to acquire a richer vocabu-

lary, because he now dares to attend actively to many stimuli to which he has previously been negatively conditioned. With the correct movements of muscles, associated with the correct sequence of sounds which he thus learns, he may produce any given word or sentence, after he has mastered the complete process. It cannot be done in sudden or spectacular fashion, however, because he must not only learn how to make all of the correct movements for the sounds used in speech and to recognize differences between similar movements, but must learn to make them in correct sequence. Otherwise he may tend to learn only separate and individual sounds, and may lack the ability to blend them as in normal speech. Having learned to say a few simple words he must enlarge his vocabulary to cover his daily needs and experiences and then—perhaps hardest of all in cases of defective speech—he must eliminate an entire vocabulary of wrong sounds or "noises," which have been formed as the result of false perceptions, and incorrect muscular habits. This often requires many months, and constitutes one of our chief arguments for the early training of the child with a speech handicap. Indeed, we have found in experimental work with several infants just learning to talk, that the early teaching of the correct patterns may start a child in the correct movements from the beginning, and produce a clearer type of speech in children of normal mentality, eliminating the use of baby talk altogether.[8]

Through the research of the past few years and the constant watching and application of the Hill-Young Method to the speech problems of childhood, the writer has become convinced that facts of real import to the science of speech, are being revealed; and that a moto-kinaesthetic method such as we have described, offers many advantages over speech training based largely upon primarily auditory or visual cues.

[8]Young, E. H. Speech Help for the Infant. Elem. School Speech Jour., 1937.

CHANGES OF ADDRESS

Fellows and Associates who have changed their addresses, their professional connections, and received higher degrees than those listed in the 1937 Year Book which appeared in the March Journal should send these changes to the editor of the Journal as well as the Secretary at once (419 Boylston Street, Boston, Mass.). A few members become lost each year because they fail to send the secretary their new addresses; although the Secretary and the Editor notify each other of changes in address, it is well to notify both officers, as the Secretary receives a number of temporary summer addresses from the Editor which cause delay.

SAMUEL D. ROBBINS, *Secretary.*

BOOK REVIEW

A HANDBOOK OF CLINICAL SPEECH. By H. KOEPP-BAKER. Edwards Bros., Ann Arbor, Michigan, 1936.

The author has presented a considerable amount of material particularly suitable for high-school or college use by speech clinicians. The volume prepares the way for the speech therapist's task, by first orienting the patient as to his speech difficulty, and indicating how he may co-operate with his instructor to the best advantage. In a chapter dealing with stuttering, the author calls attention to important researches which have been conducted in the laboratories of the State University of Iowa, in the field of speech pathology, and he draws frequently upon the contributions of this institution. There is a detailed outline of speech therapy for the treatment of stuttering, including specific projects, questionnaires, and speech situations. Writing drills and various one-handed motor activities are suggested to aid in the establishment of a dominant lead in that portion of the speech motor areas which is opposite the preferential hand.

While the treatment of chapters describing the vocal mechanism adds little to existing theories, the matter is brought up-to-date by the use of excellent cuts, diagrams, motion picture studies of the vocal cords in action, laryngeal recordings during vocalization and similar recent laboratory studies. The author describes some of the speech disorders commonly found in school, college and hospital speech-clinic. Tables and graphs are included to illustrate such disorders as cleft-palate. Common dyslalias of childhood are described as well as various other articulatory difficulties of interest to the teacher of speech. The latter part of the book is devoted to treatment suggestions, and includes many articulation exercises, short selections specially designed for the sounds of English speech described in each paragraph. These suggestions should prove useful to the busy clinician and teacher of speech who may be on the alert for new material.

The usefulness of the book would be increased if it included an index. One wishes that the author had avoided the too-frequent use of the term "speech-defective," in addressing the patient. This is somewhat compensated for, by the wealth of illustrations used and the visual presentation of many phases of the subject not often so thoroughly described, outside medical books. The various steps are treated with clearness, simplicity and a facility of expression unusual in so new and so young a writer in the field of speech pathology. The reader is impressed with his sincerity, sound psychological viewpoint and scientific background.

SARA STINCHFIELD HAWK, Ph. D.,
Univ. of So. California.

BILATERALLY RECORDED BRAIN POTENTIALS FROM NORMAL SPEAKERS AND STUTTERERS

LEE EDWARD TRAVIS, Ph.D.,
AND
JOHN R. KNOTT, M.A.
University of Iowa

This is a preliminary report based on a small sampling of 17 stutterers and 15 normal speakers. The brain potentials were recorded in the standard manner, using matched non-interfering amplifiers which fed a multi-element oscillograph providing permanent records on photographic film. The potentials were led off from the brain by means of needle electrodes inserted through the scalp; one electrode of each pair was placed over the visual area, the other over the motor area. This gave a mass activity picture which, while admittedly complex, is the only known picture of the total motor activity of the cortex.

The records were obtained during silence and speech while the subject, with eyes closed, was seated. In the case of the stutterers, one experimenter signalled all detectable moments of stuttering. This signal was incorporated in the permanent record.

The analysis of the data was made to determine the degree of synchronization and isomorphism existing between the brain potential patterns from the two sides. Lack of these characteristics was expressed as: (1) Out-of-phase (the waves from the two hemispheres being 45 degrees or more out of phase); and, (2) Dissimilarity (the waves from one hemisphere being large and slow (10 per sec. alpha waves) and those from the other being small and fast (15–40 per sec. beta waves).

The records were read continuously in one-hundredth sec. intervals, and the percentage of time showing synchronization and isomorphism and the lack of these determined. The following two tables give a summary of the results. (It will be noted in these tables that the number of subjects varies. This is due to technical difficulties with the amplifiers which were beyond experimental control.)

The significance of the difference between each meaningful pair of percentages was computed. The following were determined to be statistically significant (critical ratio greater than 2.8): during silence, stutterers showed more dissimilarity than normals; during non-stuttering speech, stutterers showed less out-of-phase relationships than normals during speech; stutterers showed less dissimilarity during non-stuttering speech than during silence; and stutterers showed less dissimilarity during stuttering than during silence.

TABLE I

PERCENTAGES OF TIME OUT-OF-PHASE AND DISSIMILARITY FOR STUTTERERS

Silence (16 cases, N = 233 sec.)	
Dissimilarity	15.1
Out-of-phase	5.0
All Speech (17 cases, N = 1117 sec.)	
Dissimilarity	3.3
Out-of-phase	2.4
Stuttering Speech (16 cases, N = 249 sec.)	
Dissimilarity	2.6
Out-of-phase	3.9
Non-Stuttering Speech (17 cases, N = 868 sec.)	
Dissimilarity	3.4
Out-of-phase	1.9

TABLE II

PERCENTAGES OF TIME OUT-OF-PHASE AND DISSIMILARITY FOR THE NORMALS

Silence (15 cases, N = 225 sec.)	
Dissimilarity	6.6
Out-of-phase	5.4
Speech (11 cases, N = 192 sec.)	
Dissimilarity	8.5
Out-of-phase	7.7

In general these findings indicate that during silence, the stutterers were more likely than the normals to have dissimilar, and during speech efforts, more perfectly matched brain potential patterns from the two hemispheres.

We then treated the data to discover whether or not all stutterers were more perfectly matched during speech than in silence, and whether or not all normals were less perfectly matched. Our results showed no clear-cut diagnostic differences, but they showed that all of the stutterers used in the experiment gave less dissimilar activity during their total speech (stuttering and non-stuttering combined) than during silence.

From the data presented above, we might assume that, since the stutterers were less perfectly matched with regard to similarity during silence than were the normals, there is some relation between the relative amount of such dissimilarity in stutterers and the relative severity of the stuttering.

This was checked by correlating the rank order percentage of dissimilarity and the rank order percentage of out-of-phaseness with the rank order percentage of time stuttered (as determined from the signalled spasms on our records). These correlations yielded the following: (1) the greater the severity of the stuttering the less dissimilar the two sides of the brain during silence (rho= $-.66$); (2) the greater the severity of the stuttering, the more out-of-phaseness during silence (rho= .32).

Other correlations yielded: (1) the greater the severity of the stuttering, the less dissimilarity during non-stuttering speech (rho= $-.34$); (2) no relation between severity of stuttering and relative amount of out-of-phase activity during non-stuttering speech (rho= $-.09$); (3) the greater the severity of stuttering, the more dissimilarity during stuttering speech (rho= .20); and (4) the greater the severity of stuttering, the more out-of-phaseness during stuttering speech (rho=.53).

Unfortunately these two sets of correlations do not tend to support each other in any systematic way. It may be concluded, therefore, that this research has raised more questions than it has answered with respect to the functioning of the higher levels of the central nervous system during the moment of stuttering. Further research designed to clarify certain of the issues raised here is being carried on at present and will be reported upon its culmination.

SOCIETE FRANCAISE DE PHONIATRIE

Le VIè Congrès sura lieu en Octobre 1938. Le rapport suivant sera présenté par MM; les Prs. Euziere, Terracol et le Dr. Lafon (Montpelier): "Les troubles du langage dans les affections organiques du cervesu, aphasies excépteés."

It is hoped that as many of our members as plan to be abroad this summer can arrange to attend this next meeting of the French Association in October.

NOMENCLATURE COMMITTEE

Final Report of the Nomenclature Committee on the First Edition of the Dictionary of Terms Dealing with Disorders of Speech

The first edition of the Dictionary of Terms Dealing with Disorders of Speech which was published in 1931 is now out of print, and the Nomenclature Committee herewith submits its final report of sales and expenditures in connection with this Dictionary, and asks for an appropriation of two hundred dollars, including balance of $180.60 on hand, for the publication of a new revised and enlarged edition.

Number of copies sold by secretary	660
Number of copies sold by Expression Co.	188
Number of copies given to collaborators	68
Other free copies including lost in mails	24
Unaccounted for, perhaps not delivered	60
Total copies ordered	1000
Received for 848 copies sold	$424.06
Interest from bank	18.47
Total receipts	$442.53

EXPENSES

1000 copies of Dictionary itself	$164.50
5000 circulars advertising dictionary	27.25
500 order blanks	8.50
300 envelopes with clamps	7.25
Other printing	12.80
Postage	27.91
Express	4.97
Advertising in Quarterly Journal	6.40
Miscellaneous	2.35
Total	$261.93

Balance on hand in Belmont Savings Bank is $180.60.

Samuel D. Robbins,
Chairman, Nomenclature Committee.

VÈ CONGRES
de la
SOCIETE FRANCAISE DE PHONIATRIE

19 OCTOBRE, 1937

RAPPORT: "*Séméiologie stroboscopique des affections du larynx et de la voix.*"

Le Dr. TARNEAUD (Paris) met au point la valeur de l'examen stroboscopique dans la clinique laryngologique. En permettant l'observation des cordes vocales quasi-immobiles malagré la phonation, la laryngostroboscopie précise leur situation phonique et leur comportement vibratoire.

Les données fournies par l'étude laryngostroboscopique concernent la fermeture glottique, l'amplitude du mouvement vibratoire, la fréquence et la forme de la vibration. En physiologie comme en pathologie, les acquisitions dûes à la stroboscopie sont considérables.

Du point de vue physiologique, toutes nos connaissances sur la voix ont été rénovées et amplifiées, parce que la stroboscopie a permis l'étude détaillée de la vibration, la compréhension de la fonction phonique du larynx, l'explication précise du phénomène vibratoire et la vérification des actions motionnelles et réactionnelles de l'émission vocale, c'est-à-dire le conditionnement physio et physico-acoustique de la voix.

La vibration des cordes vocales comporte un mouvement ascendant dirigé latéralement, qui est conditionné par l'influx nerveux, l'état de contractilité des muscles exo et endo-laryngés et la pression du souffle expiratoire. Le mécanisme vibratoire a donné naissance à deux théories, la première physique, qui explique le rappel des cordes vocales, par l'élasticité propre des masses thyro-aryténoïdiennes; la seconde, neuro-chronaxique, qui envisage le mouvement vibratoire, malgré sa fréquence élevée, comme un phénomène de pure physiologie nerveuse.

En pathologie, la laryngostroboscopie permet de déceler toute perturbation vibratoire et de préciser toute situation anormale des cordes vocales. Elle est donc nécessaire à l'étude des affections vocales. Son intérêt dans les laryngopathies lésionnelles est limité au cas où l'altération organique exige la détermination de la perturbation fonctionnelle des cordes vocales. En conséquence, l'examen stroboscopique nous renseigne de façon précise sur les faits suivants:

1) La situation de la corde vocale dans les laryngoplégies: à noter que, dans la paralysie du dilatateur, l'examen stroboscopique permet de préciser l'existence du mouvement d'adduction de la corde vocale.

2) Le diagnostic différentiel de la paralysie récurrentielle et de l'ankylose crico-aryténoïdienne. Dans cette dernière affection, les vibrations sont le plus souvent conservées dans leur forme normale c'est-à-dire horizontale, au niveau de la partie antérieure de la corde vocale intéressée.

3) La pathogénie et la diagnostic des affections laryngées qui ont été dénommées fonctionnelles.

En concordance des perturbations de la fonction phonique du larynx, on constate toujours une anomalie de la vibration ou un trouble de la situation phonique des cordes vocales. Ainsi, la stroboscopie met en présence du symptôme laryngé fondamental de l'altération vocale, que l'observation au seul miroir laryngé est impuissante à déceler.

A ce titre, la laryngostroboscopie permet l'analyse et la discrimination de toutes les affections neuro-musculaires qui créent la dysfonction vocale et qui sont:

a) *Les hyperkinésies* traduisant l'effort imposé aux muscles du larynx par le dérèglement transitoire ou habituel de l'automatisme acoustico-phonatoire.

b) *Les hypokinésies*, et, en particulier, la parésie des adducteurs des cordes vocales et la parésie des thyro-aryténoïdiens.

L'hypotonie de l'adduction donne une image triangulaire à base postérieure et dont le sommet est situé à l'union du tiers antérieur et des deux tiers postérieurs des rubans vocaux. Elle résulte de l'hypotonie fonctionnelle de plusieurs muscles à action phonatoire synergique.

L'hypotonie des thyro-aryténoïdiens se caractérise surtout par la stroboscopie, parce qu'une corde vocale vibrante ne bat jamais de bas en haut, de sorte que l'apparition d'une composante vibratoire verticale correspond à l'affaiblissement de la contractilité musculaire du thyro-aryténoïdien.

c) *Les incoordinations vibratoires* congénitales et acquises; parmi ces dernières, il y a lieu de citer la vibration réduite, c'est-à-dire la restriction du mouvement vibratoire à une portion limitées des deux cordes vocales; ce qui constitue une anomalie pathologique, rencontrée particulièrement chez les barytons devenus faux-ténors.

En outre, l'auteur a pu, grâce à la stroboscopie, établir la dissociation des fonctions motrice et vibratoire du larynx, dans un cas où il a constaté l'abolition complète du mouvement vibratoire sur les octaves habituelles de la voix parlée, et, par conséquent, l'aphonie, alors que l'acte moteur de mise en situation phonique des cordes vocales était normal.

d) *L'inégalité de la fréquence vibratoire* des deux cordes, qui explique certaines alterations vocales et ne se voit pas sans elles.

e) *Le mécanisme de la formation du nodule.*

f) *L'appréciation du classement des voix.*

g) *Les modes phoniques anormaux.*

L'auteur ajoute qu'également, la pratique de la thérapeutique orthophonique doit faire appel au contrôle stroboscopique, puisque la guérison d'une affection vocale exige la récupération du mode vibratoire normal des cordes vocales.

Telles sont, dans leurs grandes lignes, les importantes acquisitions dûes à la stroboscopie; elles enrichissent considérablement la clinique laryngologique et phoniatrique.

Discussion Mr. Nadcleczny.

COMMUNICATIONS

La précocité, facteur de succès, dans l'éducation de la parole chez l'enfant sourd-muet, retardé ou dyslalique.—Mr. *de Parrel* (Paris), a constaté que l'adaptabilité fonctionnelle du jeune enfant de 2 à 5 ans est remarquable, notamment en ce qui concerne les mécanismes de la phonation. Cette péroide est irremplaçable du point de vue éducatif et rééducatif. Le temps n'arrange pas les choses, au contraire.

C'est surtout chez l'enfant sourd-muet que cette préparation pré-phonétique s'impose dès l'âge de 2 ans; de cette initiation précoce dépend l'avenir du sujet tant en ce qui touche à l'émission qu'à l'articulation. L'auteur y insiste depuis bien des années, mais cette notion est encore trop peu répandue.

Pour les déficients de l'intelligence, les retardés de la parole, les débiles psycho-moteurs, la sollicitation des gestes de l'articulation, l'enseignement du vocabulaire, l'entraînement phono-respiratoire constituent l'élément primordial de la réadaptation fonctionnelle.

En rééducation, le retard dans l'entrée en action, la standardisation des méthodes, l'abus des matériels éducatifs compromettent les résultats et la place d'honneur revient à l'entraînement des organes de la parole. Le rééducateur doit toujours être en état d'alerte, prêt à profiter de toutes les possibilités qui se présentent pour provoquer les sons de la voix, déclancher les premiers mouvements d'articulation, faciliter l'émission des premiers mots, consolider les premières conquêtes phonétiques. La rééducation est un combat dont la parole est le prix. Plus l'attaque est précoce, plus large est la victoire.

Démonstration de technique rééducative des troubles psycho-neuro-moteurs du type bégaiement tonique.—Mme. Louise *Matha* (Paris) traite surtout de la question de technique. Mais, avant de donner une démonstration de rééducation collective de la coordination motrice, elle présente une série de tests mentaux et moteurs pratiqués chez ses élèves bègues au Laboratoire de Psychologie de M. Lahy et d'analyses graphologiques faites par le Dr. Strélitsky. De tels documents offrent un incontestable intérêt scientifique et il ne semble pas qu'on en ait présentés de cette nature jusqu'à ce jour.

Non moins originale est la technique instaurée par l'auteur pour l'entraînement de la coordination motrice des bègues réunis en

groupe. Des exercices ingénieusement conçus permettent la mobilisation simultanée en parfait synchronisme des commandes cérébrales, des mécanismes de la phonation et des mouvements des membres. Ces exercices ont été exécutés sous la direction énergique de Mme. Louise Matha, par une dizaine de bègues et de débiles moteurs, avec une étonnante précision et un remarquable sens du rythme. Un tel résultat s'avère d'autant plus satisfaisant que de tels sujets one toujours des troubles marqués de l'équilibre fonctionnel et des synergies musculaires.

L'expérience de Mme. Louise Matha porte sur près de 200 cas de bégaiement et il semble bien que les techniques qu'elle a présentées constituent un réel progrès dans la réadaptation psycho-motrice et phonétique des bègues.

Discussion: Mr. Liébault,
Melle Jellinek,
Mr. Nadoleczny,
Mme. Borel-Maisonny.

Réponse à la discussion.

La méthode des coupes radiographiques, (Tomographie ou Planigraphie) appliquée à l'étude de la phonation.—MM. *Canuyt, Gunsett et Grenier* (Strasbourg) ont eu l'idée d'appliquer au larynx cette méthode nouvelle et de s'en servir pour étudier la phonation. Leurs recherches ont porté sur l'étude de la voix parlée et de la voix chantée. Une série de clichés ont permis de saisir la position et la forme des cordes vocales, des ventricules, des bandes ventriculaires, de la fente respiratoire et même des lames thyroïdiennes au cours de l'émission des voyelles dans les sons aigus, dans les sons graves et dans la voix parlée normale.

L'emploi des appareils électro-acoustiques dans la rééducation auditive.—Melle *Jellinek* (Gênes) utilise actuellement des appareils électro-acoustiques tout-a-fait perfectionnés pour le dépistage des troubles de l'ouïe (par audiomètres) et le développement des restes d'audition par des exercices acoustiques. Ces derniers ont pour but d'éveiller l'attention auditive du sujet et d'exciter par leur emploi méthodique et répété les fonctions souvent amoindries des centres acoustiques.

Les divers modèles d'appareils existant permettent leur adaptation à chaque trouble individuel. Ils ont toujours pour mission de renforcer les sonorités arrivant à l'oreille malade, et augmentent ainsi le champ auditif du sujet.

Pour l'éducation des enfants sourds et durs d'oreille, les appareils acoustiques collectifs permettent de nouvelles méthodes d'enseignement.

Discussion: Mr. Nager,
Mme. Matha.

Réponse à la discussion.

Sur le mécanisme des altérations vocales dans les affections disséminées du cerveau.—Les affections disséminées étudiées par MM. *Schiff* et *Labarraque* (Paris) comprennent: l'encéphalite épidémique la maladie de Parkinson, la paralysie pseudo-bulbaire. Les anomalies de la langue étant un symptôme assez important dans ces affections disséminées du cerveau, les auteurs se sont livrés au palper lingual de tous leurs malades. Ces investigations les ont conduits à distinguer d'une manière très nette une hypotonie linguale remarquable dans l'encéphalite épidémique et une hypertonie manifeste dans les syndromes de Parkinson et pseudo-bulbaire. Pratiquement, les auteurs définissent le timbre vocal de ces maladies nerveuses par les termes suivants: "voix monotone, uniformément détimbrée monocorde et nasalisée chez les encéphalitiques; voix voilée, enrouée ou, le plus souvent, nasonnée chez les Parkinsoniens et les pseudo-bulbaires." Recherche de la sensibilité pharyngienne et du voile.

Enfin, l'examen du larynx révèle des modifications tellement inconstantes que les auteurs ne peuvent trouver en cette région l'explication de ces coloris si dissemblables du timbre vocal des trois affections disséminées du cerveau.

Catégories et registres de la voix.—MM. *Nadoleczny* et *Zimmermann* (Munich) passent en revue la question des registres et celle du classement de la voix.

Les registres sont un fait physiologique et physique; Sous cette désignation, on doit comprendre une suite de sons de timbre égal que l'ouïe musicale distingue d'une autre suite de sons aussi de timbre égal. Les limites en sont marquées par les passages, leur timbre est le résultat d'un rapport constant des harmoniques.

Le classement des voix nécessite la recherche des caractères acoustiques et anatomiques du sujet. Fait important: les auteurs ont pu mesurer de façon précise avec l'appareil de trendelenburg la longueur des cordes vocales et noter que le classement de la voix est en rapport avec cette longueur.

Discussion: Mr. Lemaître.

J. T.

BOOK REVIEWS

By CHARLES H. VOELKER
Director, Dartmouth College Speech Clinic

A RARE CASE OF APHONIA ORGANICA. By H. KOEPP-BAKER (Pennsylvania State College). Iowa City: *Archives of Speech* 1: 231–247 (June) 1936.

This study of phoniatry in a case of laryngeal web stands to become a paper of reference on the subject. The historical treatment as well as the therapy, the physiologic progress of which was constantly examined, immediately makes the author an authority on the subject. Bibliography.

MOTOR PERFORMANCE OF THE DEAF. By J. E. MORSH (Johns Hopkins). Baltimore: *Comparative Psychology Monographs* 13, 6: 51 pp., (November) 1936.

In Location-Memory Test deaf subjects confuse the associated objects more frequently than the hearing subjects. Bright normal subjects are superior to dull normal subjects in balancing performance but there is no difference between bright and dull deaf. When blindfolded, the deaf are inferior to normal in balancing performance but excel when not blindfolded. The deaf are superior to the normal in steadiness. In double plate tapping, the deaf show more imbalance than hearing subjects. The deaf are inferior to normal in Speed of Eye-Movement Test.

A SELF–ANALYSIS OF A CASE OF READING, WRITING AND SPEAKING DISABILITY. By R. V. MCKNIGHT. Iowa City: *Archives of Speech*, 1: 18–47 (March) 1936.

In this paper the patient, herself, describes and analyses her own case which was a combination of dyslexia, dysphasia and dysphemia. It gives speech pathologists a technical study of the person who has the speech defect.

THE MOTOR CAPACITIES OF STUTTERERS. By H. M. CROSS. Iowa City: *Archives of Speech* 1: 112–132 (March) 1936.

Stutterers are significantly inferior to normals in bimanual activity, and the rate of movement (right hand, left hand, lips, jaws, tongue, and diaphragm, but not unimanual activity. "On the Stanford Motor Skills Unit stutterers showed more similarity between the two hands or more ambidexterity than normal speakers. . . Left handed normal speakers were superior to the stutterers in the rate of movement of only the left hand." The normals presented a greater degree of irregularity and a greater number of superimposed smaller and more rapid movements in the voluntary movements of the hands and speech structures. The subjects were 21 stutterers, 31 right handed normals and 11 left handed normal speakers. Bibliography.

A COMPARATIVE STUDY OF THE MOVEMENTS OF THE BREATHING MUSCLES IN SPEECH AND QUIET BREATHING OF DEAF AND NORMAL SUBJECTS II. By C. G. RAWLINGS (New Jersey School for the Deaf). Washington: *American Annals of the Deaf*, 81: 136–150 (March) 1936.

"The speech of the deaf group showed the following abnormalities as compared with the normal group: (1) extremely slow and labored speech; (2) speech was accompanied by excessive expenditure of breath; (3) abnormalities of rhythm; (4) improper function of consonants with the consequent addition of extra syllables between abutting consonants; (5) measurements showed an equal amount of breath being expended by normal subjects both in speech and quiet breathing over a specified period of time; (6) the deaf expend relatively little more breath in speech than they do in quiet breathing over a given period of time; the deaf expend relatively little more breath in speech than do normal subjects over a given period of time. . . . It is essential that the speech of the deaf be speeded up so as to more closely approximate normal speech rapidity; (8) there was a high positive correlation between the abnormalities and the degree of hearing loss." No. 1 of this paper appeared in the same journal, 80: 147–156 (March) 1935.

SPEECH HYGIENE. By B. BRYNGELSON (University of Minnesota). Ann Arbor: *Quarterly Journal of Speech*, 22: 611–614 (December) 1936.

"Speech training, then, is training in the fundamentals of human behavior as seen through verbalization. What we say and how we say it becomes a matter of significance only where the underlying motives are understood."

AN ANALYSIS OF PRECEDENCE OF MOVEMENT IN SIMULTANEOUS CONTRACTION OF HOMOLOGOUS MUSCLE GROUPS. By L. E. TRAVIS, W. W. TUTTLE and W. R. G. BENDER (University of Iowa). Iowa City: *Archives of Speech*, 1: 170–178 (June) 1936.

An attempt was made in this study to analyze the precedence of movement in simultaneous contraction of homologous muscle groups. Four groups of subjects were used; a right handed, a left handed and an ambidextrous group of normal speakers and a group of stutterers. The elevation of the two forearms with the elbows resting on a table was the movement studied. The following conclusions were drawn: (1) when both the stimulus and the response are simple and the subject left either to direct his attention as he chooses, or has his attention called to the necessity of moving his arms simultaneously, normal speakers regardless of their handedness index are largely ambidextrous or equally distributed in regard to handedness; (2) when the movement is simple and the stimulus is complicated thus calling the subject's attention to the latter rather than the former, normal speakers give precedence of movement in harmony with their handed-

ness as expressed in every day manual activities; (3) a group of stutterers, the majority of whom were in the process of being shifted to the left hand in manual activities were predominantly ambidextrous or equally divided in regard to handedness regardless of the relative complexity of the stimulus and the response.

A STUDY OF MIRROR READING IN SPEECH DEFECTIVES AND NORMAL SPEAKERS. By C. A. PETERS. Iowa City: *Archives of Speech* 1: 48–60 (March) 1936.

"There is a statistically significant relationship between facility in mirror reading ability and stuttering," and right eyed, left-handed subjects (and vice-versa). "The lack of relationship between mirror reading ability and oral inaccuracy, silent reading rate, silent reading comprehension, and intelligence quotient serves to emphasize the significance of the relationship between stuttering and mirror reading ability. . . The relation of both stuttering and confused laterality to facility in mirror reading is to be construed as further evidence of a relationship between stuttering and confused laterality. . . The competition between the cortical centers controlling lateral determination has, in effect, established an undesirable facility in mirror reading. It is proposed that this facility in mirror reading premises the habit of laborious scrutiny of each symbol. This habit, presumably, has been acquired because of infacility in normal left-to-right reading and as a compensation for a lack of definite cerebral dominance."

AN ACTION CURRENT STUDY OF MUSCLE CONTRACTION LATENCY WITH SPECIAL REFERENCE TO LATENT TETANY IN STUTTERERS. By R. SHACKSON. Iowa City: *Archives of Speech*, 1: 86–111 (March) 1936.

Stutterers show significantly shorter action current-muscle thickening latencies than normal speakers. "This may indicate a latent tetany in the stutterers. . . Latencies between silence and stuttering were not statistically significant." In contrast to normals "stutterers showed the following: tremors at rates of 50 and 300–600 per second in the muscle thickening records; extremely rapid alternation of gross action currents into volleys occurring about fifty times a second; and the occurrence of single isolated action currents of great amplitude. Bibliography.

A COMPARATIVE STUDY OF SPEECH DEFECTIVE CHILDREN. By J. A. Carrell (Moosehart Lab. for Child Research). Iowa City: *Archives of Speech*, 1: 179–203 (June) 1936.

"Of the school population at Moosehart, 10.22% were found to have defective speech." This defective group had a lower intelligence level than the general school population, were inferior in school achievement, but showed no significant differences in the medical and dental examinations. The sound substitution group was significantly inferior on auditory acuity and both the physical and psycho-physical items in the anthropometric measures. Bibliography.

BIBLIOGRAPHY (*Continued*)

SPEECH FOR THE DEAF CHILD

BEAMAN, SUSAN. *Making Speech Drill Interesting.* Volta Review, Aug., 1935; 473.

CLOUD, DANIEL T. *Touch and Hearing in Speech Work.* Volta Review, June, 1935; 350.

Deaf Child's Conversation. Volta Review, Sept., 1935; 531.

DRUOUT, E. *La methode Belge au Congres de Strasbourg. Revue generale de l'enseignement des sourds-muets,* 1934.

DRUOUT, E. *La preparation a la parole en method Belge. Revue generale de l'enseignement des sourds-muets,* 1935; 155–158.

DRUOUT, E. *Quelques cas de demutisation partielle obtenus par la methode globale. Revue generale de l'enseignement des sourds-muets,* 1935; 65–73.

HANCOCK, E. FRANCES. *Use of Diagnostic Speech Charts.* Volta Review, Nov., 1935; 645.

HAYCOCK, G. S. The Teaching of Speech. Stoke-on-Trent, Hill and Ainsworth, Ltd., 1933.

HAYCOCK, G. S. *Teaching the Deaf Born Child to Speak.* Teacher of the Deaf, Oct., 1935.

HUDGINS, C. V. *A Study of Respiration and Speech.* Volta Review, June, 1936; 341.

HUDGINS, C. V. *Comparative Study of the Speech Coordinations of Deaf and Normal Subjects.* Reprint, Jour. Genetic Psychol., Mar., 1934.

HUDGINS, C. V. *Visual Aids in the Correction of Speech.* Volta Review, Nov., 1935; 637.

KENNARD, MARIE. *Pictures Used with Drill Verbs.* Volta Review, Mar., 1935; 157.

LAMB, MARION H. *Some Suggestions for Corrective Speech Work.* Volta Review, Mar., 1935; 133.

ORR, MARIE P. *Incentives to Better Speech.* Volta Review, Oct., 1935; 592.

PETERSON, EDWIN G. *Speech and Lip Reading in Western Canada.* Volta Review, Feb., 1933.

RAWLINGS, CHARLES G. *A Comparative Study of the Movements of the Breathing Muscles in Speech and Quiet Breathing of Deaf and Normal Subjects.* Annals, Mar., 1935; Mar., 1936.

SENSENIG, ANNE. *Speech and Vocabulary Development through Auricular Training.* Volta Review, May, 1933; 212.

SMITH, SHERMAN K. *Speech Patterns.* Volta Review, Apr., 1933; 160.

STOBSCHINSKY, ROBERT. *Speech, the Jena Method Applied to:* Volta Review, Aug., 1933; 325.

SYLVANIA, SISTER, S. S. J. *Correlation of Comprehension and Speech in the Education of the Deaf.* Annals, Sept., 1934.

VOELKER, CHARLES H. *Sound Count for the Oral Curriculum.* Volta Review, Mar., 1935; 155.

VOELKER, CHARLES H. *A Preliminary Strobophotoscopic Study of the Speech of the Deaf.* Annals, May, 1935.

WARE, MARY, ET AL. *Natural Speech for the Deaf. A Discussion.* Volta Review, Jan., 1936; 216.

SPEECH—GENERAL

ATHERTON, GRACE W. *Speech and the Hard of Hearing Child.* Volta Review, Dec., 1935.

BOOME, E. J. *The Difficult Child. A Study of Stammerers.* Teacher of the Deaf, June, 1934.

LACK, A., AND MEADOWCROFT, G. *Aphasia.* Teacher of the Deaf, Aug., 1935.

PROCTOR, JESSIE. *Aphasia in Children.* Teacher, June, 1936.

SCHARFE, ERNEST E., M.D. *Value of Speech Training in Cases of Cleft Palate and Other Oral Conditions.* Arch. Otol., Nov., 1935.

SHAW, M. OCLO MILLER. *Study in the Analysis and Correction of the Speech of the Hard of Hearing.* Annals, May, 1936.

WEST, ROBERT, Ph.D. *Speech and Hearing.* Volta Review, Oct., 1935; 573.

WEST, ROBERT, Ph.D. Bibliography of Disorders of Speech and Voice. Madison, Wisc., College Typing Co., 1934.

WEST, ROBERT, Ph.D. Disorders of Speech and Voice. 2d ed. Madison, Wisc., College Typing Co., 1933; 3d ed., 1935.

SUCCESSFUL DEAF AND HARD OF HEARING PERSONS
(BIOGRAPHICAL SKETCHES)

DRUOUT, E. *An Hour with Suzanne Lavaud.* Volta Review, Aug., 1933.

Deaf Brothers who are Winning Success. (*Duning, Hilbert, and LeRoy*). Volta Review, Mar., 1933.

HOLT, LAURA DAVIES. *Budding Poets Who Cannot Hear* (*Stephen Koziar and Loy Golloday*). Volta Review, Aug., 1933, 334.

MONTAGUE, HARRIET. *He Calls Deafness an Adventure* (*Dr. Orson W. Israelsen*). Volta Review, Sept., 1935; 531.

Successful Deaf Students in England. Volta Review, May, 1933; 208.

THOMPSON, JACK ELLIS. *A Wider World for the Deaf.* Volta Review, May, 1933; 197.

STEPHEN VINCZE, LL.D. *Autobiographical Sketch.* Volta Review, Nov., 1935; 673.

VOGT, GUSTAV. *Finland's Hard of Hearing Sculptor* (*Waino Aaltonen*). Volta Review, Nov., 1936; 661.

VOICE

CONNERY, J. M. AND YOUNG, I. B. *Voice Building.* St. Louis, 1935.

FELDERMAN, LEON. *Practical Application of Voice Dynamics.* Laryngoscope, Nov., 1934.

RUSSELL, G. O. *Our Voices: Some New Scientific Facts Pointing to Improvement.* Rep. Proceed. 15th Ann. Meet. A. S. H. H., 1934.

MISCELLANEOUS

AMERICAN SOCIETY FOR THE HARD OF HEARING. Proceedings of the Annual Meetings, 1933–1936. 1537 35th St. N.W., Washington, D. C.

BJORLEE, IGNATIUS, M.A. *Survey of the Adult Deaf of Maryland.* Annals, Mar., 1933.

BONNELL, BAKER. Impaired Hearing. A Symposium of Considerations. Assembled by B. Bonnell. Board of Education, Muskogee, Okla., 1935.

BRILL, TOBIAS. *A Guild to the Literature on the Deaf.* Annals, Mar., 1936.

GOLDSTEIN, M. A. Problems of the Deaf. St. Louis, Laryngoscope Press, 1933.

"Louder Please," The Story of Your Hearing. Mouth Health Quarterly, April-June, 35–60.

MARTENS, ELISE H., Ph.D. *What Constitutes Special Education?* Annals, Mar., 1934.

MARTENS, ELISE H., Ph.D. Coordination of Effort for the Education of Exceptional Children. Office of Educ. Bulletin No. 7, 1935.

NATIONAL INSTITUTE FOR THE DEAF, LONDON. All About the Deaf. London, 1934.

ROGERS, JAMES FREDERICK, M.D. *The Posture of the Deaf.* Annals, Sept., 1934.

TAYLOR, HARRIS. Index of Research Activity on Problems of the Deaf. Conf. of Executives of Am. Schools for the Deaf, 1936.

TIMBERLAKE, JOSEPHINE B. *The Volta Bureau, a Clearing House.* Rep., Volta Bureau, Sept., 1934.

TIMBERLAKE, JOSEPHINE B. *The Volta Bureau's Far Flung Battle Line.* Rep., Volta Review, Oct., 1934.

TROTT, L. D. *Take Care of Your Ears.* Life and Health, Sept., 1935.

UREN, C. T. *The Responsibility of the Physician to the Hard of Hearing.* Nebraska State Med. Jour., Dec., 1935; 460.

WALSH, G. I. *Lend Me Your Ears.* The Commonweal, Dec., 1935; 179.

WHITE HOUSE CONFERENCE ON CHILD HEALTH AND PROTECTION. Committee on Physically and Mentally Handicapped. Special Education, the Handicapped and the Gifted. Century Co., New York, 1933.

WHITE HOUSE CONFERENCE ON CHILD HEALTH AND PROTECTION. Report of the Committee on the Deaf and Hard of Hearing. The Handicapped Child. Century Co., New York, 1933.

REVIEWS OF BOOKS AND ARTICLES ON THE PROBLEMS OF DEAFNESS
(Published in the Volta Review, 1933–1936)

1933:

Handbook on the Deaf Blind. (National Inst. for Blind, England.) April, 178.

Motor Abilities of Deaf Children, by John A. Long, Ph.D. May, 230.

Problems of the Deaf, by Max Goldstein. July, 309.

Psychological Study of the Effects of Deafness, A, by Dr. H. H. Welles. Mar., 117.

Some Opinions of the Oral Method Expressed by Graduates of the Oral Method. July, 311.

Study of the Deaf in England and Wales, A, by Dr. A. Eichholz. April, 179.

1934:

All about the Deaf. Published by the National Institute for the Deaf, London. June, 371.

Breaking out of Prison, by Margaret T. Monro. Oct., 623.

Comparative Study of the Speech Coordinations of Deaf and Normal Subjects, by C. V. Hudgins. Aug., 497.

Comparison of the Intelligence of Deaf and Hearing Children, by Keith MacKane. July, 431.

Corrective Measures for Progressive Deafness, by Gordon Berry, M.D. Nov., 688.

Deafness, Its Humanitarian Problems, by George E. Coleman. Nov., 688.

Hearing Aids for the Deaf, by T. S. Littler. April, 242.

Lucky Lady, The, by Margaret Prescott Montague. Jan., 44.

Methods of Testing and Management of the Deafened School Child, by Edmund Prince Fowler, M.D. Oct., 625.

Observations on the Pathology of High Tone Deafness, by Drs. Samuel Crowe, Stacy Guild and Leroy Polvogt. Sept., 560.

Proceedings of the International Congress on the Education of the Deaf. Dec., 750.

Some German Views on the Education of the Deaf. Compiled and Translated by Fritz and Grace Heider. Mar., 141.

Suggestions for Teaching Rhythm to the Deaf, by Margaret S. Kent. June, 368.

Teaching of Speech, The, by Sibley Haycock. April, 239.

1935:

Abstracts of Scientific Studies. Jan., 20; Dec., 719.

Acoustimeter, The, by Aaron Roth. Mar., 176.

Aids for the Deaf, by Dr. Phyllis M. Tookey Kerridge. Sept., 550.

Anecdotal History of the Science of Sound, by Dayton Clarence Miller. Oct., 610.

Artificial Hearing Aids, by Vern O. Knudsen and Isaac Jones. April, 242.

Basic Principles Underlying Tests of Hearing, by Vern O. Knudsen and Isaac Jones. April, 242.

Can Physics Help the Deaf Child, by Phyllis M. Tookey Kerridge, Ph.D. June, 371.

Claims of the Deaf, by Hon. Rev. Edward Lyttleton, D.D. Aug., 488.

Deafness as a Psychological Entity, by Gordon Berry, M.D. April, 242.

Development of Meaningful Language in Leonard Dowdy, a Deaf-Blind Pupil at Perkins Institution, The, by Kathryn E. Maxfield. June, 340.

Diagnosis of Deafness, by Vern O. Knudsen, Ph.D., and Isaac Jones, M.D. April, 242.

Good Fight, The, by Raymond Leslie Goldman. Dec., 763.

Handicapped, by Rev. A. W. Blaxall. Feb., 110.

Improving Your Speech, by Letitia Raubicheck, Ph.D. May, 307.

Is Your Child Hard of Hearing? by Ena G. MacNutt. June, 353.

Lebensbilder bedeutender Schwerhoriger: Biographical Sketches of Outstanding Hard of Hearing Persons. Feb., 109.

Perkins Institution and its Deaf-Blind Pupils. July, 435.

Poisons to the Ear. Jan., 49.

Pre-natal Medication as a Factor of Deafness. Feb., 69.

Principles and Problems that Bear on the Jena Method, by A. Goeman. Oct., 597.

Resonant Diction for the Hard of Hearing. June, 365.

Stammering and Allied Disorders, by C. S. Bluemel. April, 241.

Written Word and the Deaf Child, by James Drever. Aug., 488.

1936:

Aural Therapy in Relation to Deafness: Prog. D. F. Fraser Harris. Aug., 471.

Choice of a Hearing Aid, The. Oct., 605.

Disorders of Speech and Voice, by Robert West. Mar., 171.

Estudios de Psicogeneses, by O. Decroly. Aug., 472.

Exploitation of the Deaf in the Sale of Aids to Hearing. Oct., 605.

Hearing Aids for the Deaf, by T. S. Littler. Aug., 473.

Impaired Hearing: A Symposium of Considerations, by Baker Bonnell. April, 235.

Kinesiologic Phonetics, by Robert West, Ph.D. and Claude E. Kantner, Ph.D. Mar., 172.

Kinzie Method of Graded Instruction in Lip Reading for Children, by Cora Elsie and Rose Kinzie. June, 358.

New Pathways for Children with Cerebral Palsy, by Leah C. Thomas. Dec., 713.

New Study in the Pintner Series. Nov., 637.

Newer Concepts of the Pitch, Loudness and Timbre of Musical Tones, by Harvey Fletcher. May, 298.

Preparation a la parole en method Belge, La, by E. Druout. April, 234.

Speech, a High School Text Book, by Wilhelmina G. Hedde and William N. Brigance. June, 361.

Study of Some Personality Aspects of Deaf Children, A, by Lily Brunschwig. Nov., 637.

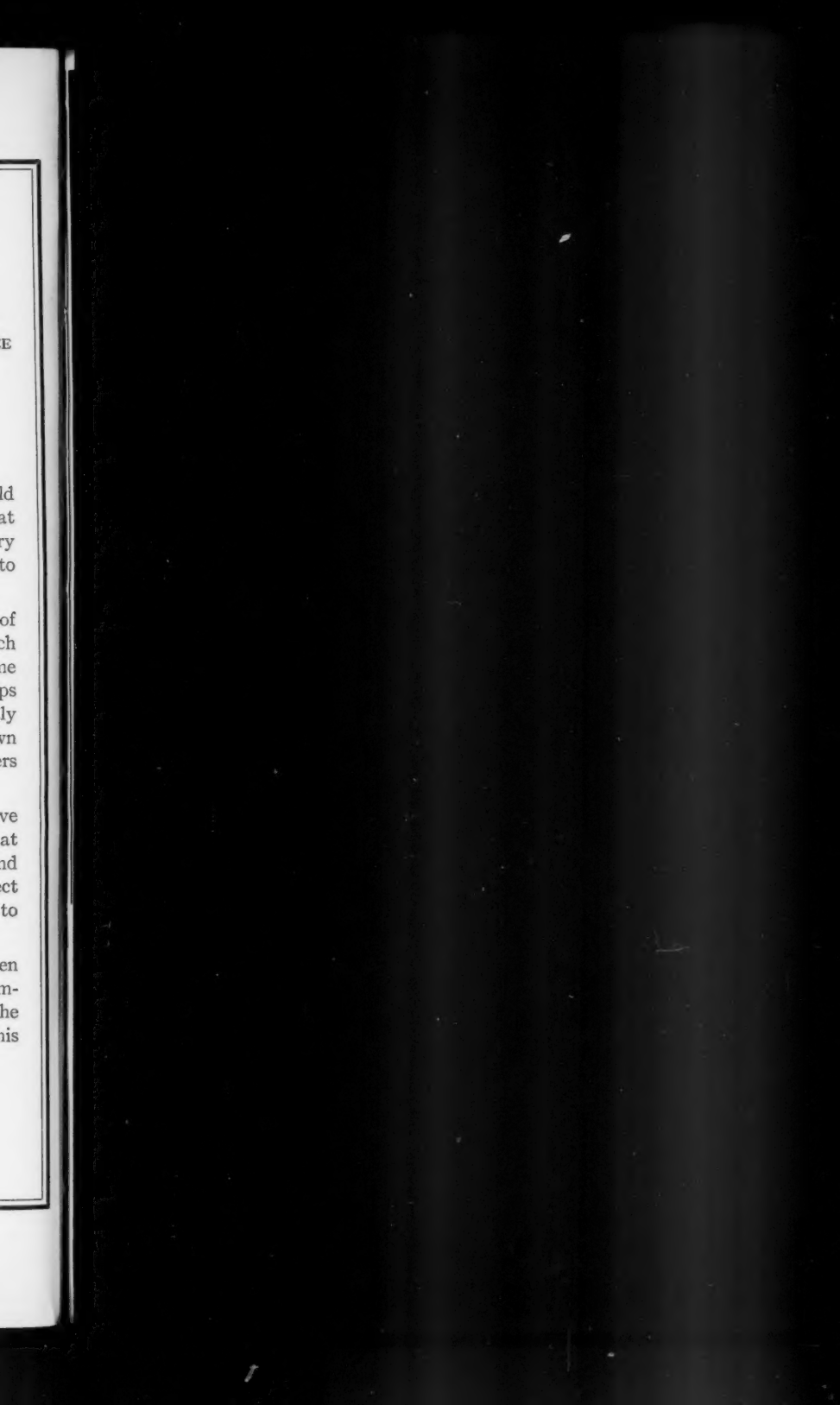
New Dictionary of Speech Disorders

AMERICAN SPEECH CORRECTION ASSOCIATION VOTES TO AUTHORIZE ITS NOMENCLATURE COMMITTEE TO PUBLISH A NEW REVISED AND ENLARGED EDITION OF DICTIONARY OF TERMS DEALING WITH DISORDERS OF SPEECH

The Nomenclature Committee, consisting of Dr. Sara Stinchfield Hawk, Dr. G. Oscar Russell, and Samuel D. Robbins, is busily at work preparing a new revised and enlarged edition of a "Dictionary of Terms Dealing with Disorders of Speech and Voice," and hopes to have the manuscript ready for press by the Autumn of 1938.

The new Dictionary will contain a revised causal classification of Disorders of Speech and a new classification of defects of voice which will run parallel with the former. In order to avoid the cumbersome second word causal suffix, *Dyslalia* has been divided into three groups —articulatory disorders due to (1) deafness, (2) structural anomaly of the peripheral speech mechanism, and (3) functional and unknown causes; and *Dyslogia* has been divided into two groups—(1) Disorders due to feeblemindedness, and (2) Disorders due to insanity.

Each definition will be complete in itself; the reader will not have to refer to other definitions in order to understand a definition as at present. Definitions will be lengthened and made more specific, and the cause of each speech defect and synonyms for each speech defect will appear at the end of its definition. Many new definitions are to be added.

The publishers of the Journal of Speech Disorders have been awarded the contract for printing the new Dictionary. The Committee expects to publish a Dictionary more than twice the size of the first edition out of the profits of the first edition, and plan to sell this larger Dictionary for one dollar a copy postpaid.

SAMUEL D. ROBBINS
Chairman Nomenclature Committee.